REPORT RESUMES

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ABSTRACTS OF STUDIES IN AGRICULTURAL EDUCATION, CENTRAL REGION, FOR THE YEARS 1963-64.
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SIXTY-FOUR DOCTORAL DISSERTATIONS, STAFF STUDIES, AND MASTERS' THESES IN AGRICULTURAL EDUCATION ARE REPORTED IN THE FOLLOWING AREAS -- (1) COMMUNITY COLLEGES AND TECHNICAL SCHOOLS, (2) CURRICULUM STUDIES, (3) EDUCATIONAL ASPIRATIONS, EXPECTATIONS, AND GUIDANCE, (4) EDUCATIONAL MEDIA AND MATERIALS, (5) EVALUATION STUDIES, (6) EXTENSION STUDIES, (7) FARM MECHANICS STUDIES, (8) FARMING OPPORTUNITIES STUDIES, (9) FOLLOWUP OCCUPATIONAL STUDIES, (10) INTERNATIONAL AGRICULTURAL EDUCATION, (11) MANAGEMENT INSTRUCTION, (12) MISCELLANEOUS STUDIES, (13) TEACHER EDUCATION IN AGRICULTURE, AND (14) TECHNICIAN TRAINING AND AGRICULTURALLY RELATED OCCUPATIONS. THE PURPOSE, METHODS, AND FINDINGS OF EACH STUDY ARE SUMMARIZED. THE STUDIES ARE ARRANGED ALPHABETICALLY BY AUTHOR WITHIN EACH SUBJECT AREA. A TABLE OF CONTENTS IS INCLUDED. (JM)

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ABSTRACTS OF STUDIES

in

AGRICULTURAL EDUCATION

Central Region

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For the Years

1963-64.

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University of Minnesota
Department of Agricultural Education
St. Paul, Minnesota

November, 1965

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I COMMUNITY COLLEGES AND AREA TECHNICAL SCHOOLS

VORHIES, RALPH M. Status and Role of the Non-Transfer Agricultural Education Program in California Junior Colleges. Dissertation, Ed.D., 1964 University of Missouri, Columbia, Missouri.

Purpose.-- The purpose of this study was to determine the past, present, and future role of the junior college in providing non-transfer agricultural education in California.

Method.--The descriptive research method was used. Information was collected in the following ways: (1) By an interview schedule filled out while visiting junior college personnel, (2) By an inquiry form mailed to 201 former students who entered college in 1959, (3) By a form sent to employers of cooperating former students, (4) By information sheets sent to deans of agriculture at state colleges.

Findings.-- Agriculture has been included in offerings to California junior colleges from their beginning in 1910. Nineteen of the 70 junior colleges in the state taught some agriculture in 1963.

Only about one-fourth of the students surveyed had finished the two-year agriculture course in junior college. Financial considerations were the most frequently listed reason for withdrawal. Nearly 80 percent of the students had a rural background and about one-half of them had vocational agriculture in high school.

Most of the courses taught in the agricultural programs at the junior colleges are designed for transfer students. Agricultural technician training was initiated recently by two of the larger agricultural departments in California junior colleges. This training is terminal and designed to fit students for jobs in related agricultural fields. The curricula are offered in additon to the regular transfer courses.

A study of the employment history of the former students showed about one-fourth to be self-employed. Of the other three-fourths, approximately one-third are in production agriculture, another third in non-agricultural areas, and slightly less than a third in occupations related to agriculture.

The opinion survey of employers showed that 70 percent would hire more two-year agricultural trainees from junior colleges. Most of them felt the employees had benefited from the training. Most of the students felt that their college training had helped them advance faster and farther on their jobs than they could have otherwise. Half of them felt that a four-year degree would have been more helpful.

Terminal curricula in agriculture are offered at only three of the four-year colleges in California, i.e., Fresno State, Chico State, and at the San Luis Obispo campus of California State Polytechnic College. The latter has the largest enrollment, and it also has the largest number of specialization areas. Animal husbandry is the most popular major in agriculture at all three of the four-year colleges. The admission requirements and costs at the state colleges are higher than at the junior colleges.

SNEPP, NEIL OWEN. Agricultural Offerings in Community Colleges in the United States. Dissertation, Ph.D., 1963, The Ohio State University. 244 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The major purpose of the study was to propose an initial post secondary program in agriculture at the community college level for Ohio. In accomplishing the major purpose, selected aspects of agricultural programs in public junior colleges in the United States were identified, opinions concerning desirable programs in agriculture were secured from persons engaged in agricultural programs at community colleges and implications and guidelines for agricultural programs in community colleges were developed.

Method.-- A listing of public community colleges with agriculture offerings was compiled and a sample of 161 colleges drawn, equal to 69 percent of the total listing. Responses to a comprehensive mail questionnaire were received from 72 percent of the sample. Additional data was secured from 44 of the 50 State directors of vocational education.

Findings.-- Two types of conclusions were drawn, the first based upon the existing situation as reported, the second based upon the respondents' opinions of the most desirable agricultural programs in community colleges. While 30 percent of the public junior colleges listed agriculture as a curricula offering, they were in effect offering pre-agriculture. Transfer and terminal-technical programs enrolled 80 percent of the agricultural students. Adult education programs in agriculture were nearly non-existant.

Agricultural enrollments in the majority of junior colleges were less than 50 students. However, 25 percent of these colleges had agricultural enrollments over 100 students. The most comprehensive agricultural programs were found in these colleges. State funds were used for capital costs by 90 percent of those reporting while operating costs were met by a combination of state and local funds and student tuition.

The major problems in establishing and operating agriculture programs in junior colleges were those of attaining public understanding and adequate financial support. Agricultural programs in junior colleges should include transfer, terminal-technical, vocational, and adult education curricula.

Twenty-one guidelines were formulated to provide direction for the development of agricultural programs in community colleges.

II CURRICULUM STUDIES

BEEKS, JOHN C. Pre-College Experiences as Preparation for College Courses in Agronomy. Dissertation, Ed.D., 1964, University of Missouri. 117 p., Library, University of Missouri, Columbia, Missouri.

Purpose.-- The purpose of this study was to determine the knowledge of agronomy possessed by entering freshmen in the College of Agriculture at the University of Missouri. An additional purpose was to determine if agricultural experiences had an effect on knowledge of agronomy, and if the knowledge was sufficient to justify granting credit by examination.

Method.--A testing instrument was constructed consisting of 100 multiple choice items, each with four alternatives. The instrument was divided into two similar sections. One was over material presented in the course, Field Crops I, the other section was over material used in Introduction to Soil Science.

The testing instrument was administered in the required course, Agriculture in the Economy, during the years 1962 and 1963. A total of 310 usable answer sheets were obtained. This population was grouped into ten categories:

(1) Those with vocational agriculture
(2) Those without vocational agriculture
(3) Those with 4-H
(4) Those without 4-H
(5) Those with farm experience
(6) Those without farm experience
(7) Those with vocational agriculture but no 4-H
(8) Those with 4-H but no vocational agriculture
(9) Those with no agricultural experience
(10) Those with one or more of the agricultural experiences.

Findings.-- (1) Students without agricultural experience had significantly higher means on the School and College Ability Test than those with agricultural experience. (2) Students with more than one year of vocational agriculture were better prepared in agronomy than those students without such experience. (3) Students with more than one year of 4-H experience were better prepared in soils but not necessarily better prepared in field crops. (4) Students who had lived on a farm for more than two years were better prepared in agronomy than students without this experience. (5) Students with experience in vocational agriculture but no 4-H, were better prepared in agronomy than students than students with 4-H but no vocational agriculture. (6) Students with any one of the experiences in agriculture were better prepared in agronomy than students with no experience in agriculture. (7) About 48 percent of the former students of vocational agriculture scored above 70 percent on the examination. Nine percent of non-vocational agriculture groups scored above 70 percent. (8) Thirty-eight percent of those students with farm experience scored above 70 percent on the examination compared to about six percent of the non-farm group. (9) Students with agricultural experiences appear to have less ability than students without agricultural experiences as measured by the School and College Ability Test. (10) Despite lower college ability, students with agricultural experiences are better prepared to participate in the basic courses of agronomy than students without such experiences. (11) A substantial number of students have demonstrated the ability necessary to be granted credit by examination if such a program were provided.

TRAMMEL, JOE ALLEN. Criteria to Use in Selecting Content for a Vocational Agriculture Curriculum and Determining the Grade in Which the Material Should Be Taught. Thesis, M.A., 1964, University of Minnesota. 154 p., Department of Agricultural Education, University of Minnesota, St. Paul, Minnesota.

Purpose.-- To test the use of selected criteria in determining the curriculum content for vocational agriculture and employ the use of other criteria to determine the grade or grades in which to teach the curriculum materials. Criterion used to select curriculum content were as follows: (1) Frequency of use, (2) Geographic universality, (3) Universality in time, and (4) Cruciality. The following criteria were used to determine the grade or grades in which the curriculum materials should be taught: (1) Frequency of use, (2) Chronology, (3) Simple to complex or complexity, and (4) Cruciality.

Method.-- A questionnaire was mailed to vocational agriculture instructors teaching in local departments who had served as instructors for student teachers during the years 1961-62, 1962-63, and 1963-64. Questionnaires were also sent to the officers of the Minnesota Vocational Agriculture Instructors Association. Names were then selected at random from other vocational agriculture departments in the state.

The questionnaire was developed by listing jobs, skills, and problem areas related to each of seven enterprise areas of instruction. The areas were sheep, beef, dairy, swine, small grains, forage crops, and soils. A questionnaire for each enterprise was developed and sent to fifteen instructors. A total of 105 questionnaires were mailed out.

Findings.-- The plurality of the respondents indicated that subject matter items from the seven enterprise areas, (sheep, beef, dairy, swine, small grains, forage crops, and soils), would be included in their curriculum as determined by the criterion Frequency of use.

Geographic universality, Universality in time, and Cruciality, in that order, were then selected most often as the rationale for including subject matter in the curriculum. Some of the respondents indicated that a few subject matter items should not be included in the curriculum.

The plurality of the respondents indicated that the enterprises would be taught in Agriculture II because of Frequency of Use. Many of them indicated that certain phases of each enterprise would be taught in other years as well as in Agriculture II.

Conclusions are that each teacher must determine the items worthy of inclusion in the curriculum and apply the criteria for determining the year or years in which to teach the material in the light of the local situation.

MCCREIGHT, DONALD EUGENE. Evaluation of Curricular Areas in Animal Science for Non-Farm Students of Vocational Agriculture. Thesis, M.S. 1964, Ohio State University. 85 p. Library, Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to evaluate the relative importance of areas and units of instruction in agriculture for non-farm high school students enrolled in vocational agriculture. Such information was considered needed and useful in curriculum development on a state, or local level, as well as for the beginning teacher who would lack an extended knowledge of employment situations and experience upon which to rely for guidance. Determining grade level and time allotted to such animal science curricular offerings for non-farm students were set forth as other objectives of this study.

Method.-- The questionnaire was selected as the most feasible method of contacting a rather large number of teachers who enrolled numerous non-farm students distributed over the state of Ohio. Seventy-five teachers were asked to evaluate areas and units in terms of importance and appropriate grade level. The writer personally handed each questionnaire to the 75 selected respondents who met the qualifications of having non-farm students enrolled in their departments of vocational agriculture. Seventy-five questionnaires were completed and returned for tabulation.

Findings.-- Teachers rated the traditional animal science areas including "dairy", "beef", "swine", "sheep", and "poultry" as needing at least "considerable importance" for non-farm students. Units of study related to buying, selling and using products indicate need for increased emphasis for non-farm students.

"Horses", "insects", "dogs", and "rabbits" rated the highest of additional curricular areas to be included for non-farm students. Units of these areas needing the greatest emphasis were "breeds", "identification", "characteristics", "commercial use", "feeding" and "training".

The ninth grade was rated as most adapted level for instruction of the technical aspects of animal science curricular areas and units. Two semesters were considered best for allotted time for such instruction.

STARLING, JOHN TULL. A Study of Integrating Biological Principles with Instruction in Vocational Agriculture. Dissertation, Ph.D., 1964, The Ohio State University. 146 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.--The purpose of the study was to determine the feasibility of integrating biological principles with instruction in vocational agriculture at the high school level in Ohio.

Method.-- The general procedures employed in the study included the selection of fifteen pilot schools and eight control schools. The teachers in the pilot schools integrated the teaching of biological principles into their teaching in solving agricultural problems. The teachers in the control schools conducted a traditional program without any change from the usual methods used in the Ohio vocational agriculture program. A pre- and post-test were given to each group and the test results were analyzed to determine the difference in achievement between the pilot and control group. The tests included were: California Mental Maturity, Agricultural Achievement, Biology Achievement, and Interest Inventory. A subjective evaluation was accomplished through the use of a questionnaire to secure teachers' opinions.

Findings.-- Students in the pilot schools showed significantly greater gain on all tests between pre- and post-test at either the .01 or .05 confidence level.

There was negative correlation between student age and achievement in biology. The older students showed less gain in biology than younger students.

The number of principles taught was the most important factor influencing change in achievement in biology.

Teachers' evaluation concerning the extent to which students were able to transfer understanding of the principles in solving other agricultural problems was very favorable. Eighty percent of the teachers checked "some" concerning the students' ability to transfer understanding and the remaining twenty percent checked "very well."

The teachers' evaluation also indicated that the biological principles approach made vocational agriculture more challenging to students by placing more emphasis on why rather than so much how.

III EDUCATIONAL ASPIRATIONS, EXPECTATIONS, AND GUIDANCE

BENTLEY, RALPH R. Factors Influencing the Vocational Choices of Agriculture College Freshmen. Staff Study, 1963. Studies in Education No. 4, 51 p. Department of Education, Purdue University, Lafayette, Indiana.

Purpose.-- To investigate the influence of selected factors on the vocational choices of freshmen agriculture college freshmen in seven midwest universities.

Method.-- Students completed a questionnaire by indicating whether each of 36 factors influenced them "a great deal," "little," or "not at all," (1) in their choice of agriculture as a career, and (2) in their choice of a field of specialization in agriculture. Also, the students were asked to select five of sixteen factors they believed to be most important in a job.

The data, obtained from 1540 students were categorized by (1) university, (2) years of experience in selected activities, and (3) field of specialization in agriculture. Chi-square was used to determine whether there were significant differences among the responses of students as categorized and percentages were computed to show the relative amount of influence students in the various categories attributed to each of the selected factors.

Findings.-- The findings of this study, regarding the amount of influence selected factors had on agriculture college freshmen with respect to: first their choice of agriculture as a career; second their choice of a field of specialization in agriculture; and third regarding the factors they believed to be most important in a job, may be summarized as follows:

1. In general, factors influencing most agriculture college freshmen with respect to their choice of agriculture as a career, likewise influenced most students with respect to their choice of a field of specialization in agriculture.

2. Persons influencing the largest percentage of freshmen were fathers, mothers, teachers of agriculture, and friends.

3. Significantly more freshmen were influenced by teachers of agriculture than by any other professional person.

4. The factors influencing most freshmen were categorized as "Work and Farm Experiences," and "Vocational Factors."

5. In general, the more experience agriculture college freshmen have had in vocational agriculture, FFA, and 4-H Club, the more influence they attributed to teachers of vocational agriculture, vocational agriculture, FFA, and 4-H Club.

6. When student responses, regarding the relative influence that each of the 36 factors had on their choice of agriculture as a career, were categorized by universities significant chi-square differences were found for six and twenty-two factors at the .05 and .01 levels respectively.

7. When student responses, regarding the relative influence that each of the 36 factors had on their choice of a field of specialization in agriculture, were categorized by universities significant chi-square differences were found for eight and fourteen factors at the .05 and .01 level respectively.

8. Opportunity factors selected by more than 40 percent of the freshmen, as one of five most important factors in a job, in order of importance are as follows: "to earn money," "to use your own ideas," "for continuous employment," "to be your own boss," "to do a variety of work," "to do good for others," and "for advancement."

9. Student responses by universities, with respect to factors selected as one of five most important in a job, were significantly different for nine of the sixteen opportunity factors.

LAYMAN, ELMO TERRY. The Vocational Education Choices of Eighth Grade Boys in the Urbana Schools. Field Study, M.E., 1964, The Ohio State University. 50 p. Agricultural Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of the study was to determine the vocational choices of eighth grade boys enrolled in the Urbana Junior High School during the 1963-64 school year, and to identify some selected factors which affected their choices. The factors studied included the father's occupation, the education level of the parents, and the students ability level.

Method.-- Two questionnaires were developed through the efforts of the writer along with the assistance of the Guidance Division of the Ohio Department of Education, and with materials provided by the Pittsburg Public Schools.

The first questionnaire was given to the eighth grade boys by the writer on May 27, 1964. The second questionnaire was sent to the parents on May 22nd and was returned on May 25th and May 26th. Eighty-seven percent of the boys in the eighth grade completed usable questionnaires and 45 percent of their parents completed questionnaires that could be matched with the sons' questionnaires.

Findings.-- A number of the findings were similar to those found in other studies. For example, approximately 71 percent desired vocational education while in high school. The vocational education choices of the respondents were centered in the areas of agriculture, drafting, electricity and welding.

Some of the factors affecting the vocational choices were similar to those of other studies also. Only 38 percent of the students chose the same occupation as their father. Another factor that has been studied some in the past was the educational level of the parents, or in other words, the amount of formal education completed by the parents. The percent of students wanting vocational education was higher among those whose parents had the highest level of education with 89.9 percent of this group wanting vocational education. Boys whose parents had just attended high school had only 42.2 percent of their group desiring vocational education.

An area not considered in most past studies was the intelligence level of the students. Not only were those students whose intelligence rating was highest the most consistant in their ability to make choices, but they also expressed more interest in vocational education than did the students of lower intelligence levels.

McNUTT, RICHARD CLINTON. A Study of the Aspirations and Expectations of Licking County, Ohio, Vocational Agriculture Students. Field Study, M.E., 1964, The Ohio State University. 60 p. Library, Agriculture Administration Building. Columbus, Ohio.

Purpose.-- The purposes of the study were to ascertain the aspirations and expectations of Licking County, Ohio, vocational agriculture freshmen and senior students, and to compare them with achievements reported by a group of previous graduates.

Method.-- The normative survey procedure was used to gather information for this study. The questionnaire was administered to the high school students by the instructors of vocational agriculture in their respective schools. The names and addresses of the graduates were obtained through the instructors so that a questionnaire might be sent to them.

Findings.-- It was found that 34 percent of the freshmen, 42 percent of the seniors and 58 percent of the graduates had no plans for post high school education. The most frequent reasons given for not planning post high school education were: "lack of interest," "financially unable," and "other vocational plans." The least important reasons indicated were: "courses too difficult," "armed forces," and "health and emotional problems."

Sixty-five percent of the freshmen and 86 percent of the seniors indicated that they aspired to farm sometime following graduation. Both the freshmen and seniors indicated that they expected full time farming to be permanent and to offer opportunity for advancement.

In the area of full time non-farming employment, the median weekly income expectations were $60.00 for the freshmen and $75.50 for the seniors. The graduates reported a median weekly income of $90.50.

Marriage plans did not appear to be a large factor in affecting the aspirations and expectations of the students.

While the study showed minor differences to exist, the overall findings pointed toward the conclusion that the aspirations and expectations of the freshmen and senior vocational agriculture students were about in line with the status and achievement reported by the graduates.

IV EDUCATIONAL MEDIA AND MATERIALS

BODENHAMER, SCHELL H. A Study of the Effects of Presenting Informative Speeches With and Without the Use of Visual Aids to Voluntary Adult Audiences. Dissertation, Ph.D., 1964, The Ohio State University. 197 p. Library, The Ohio State University, Columbus.

Purpose.-- The two major purposes of the study were:

1. To determine the comparative amount of learning that took place in informal, voluntary, adult audiences when an informative speech was presented with and without the use of visual aids.

2. To determine the difference in the way the informal, voluntary, adult audiences reacted introspectively to the effectiveness of a meeting where visual aids were or were not used in the presentation of an informative speech.

Method.-- A twenty minute speech was developed on the subject of "The Weather". Visual aids were prepared. The speech was presented at forty-six meetings. At twenty-three of the meetings the speech was presented supplemented with visual aids and at the other twenty-three meetings the same speech was presented without visual aids. Audiences were randomly divided. The investigator conducted all the meetings. Controls were used to assure identical physical facilities and arrangements.

A multiple-choice test was given to measure immediate recall after the speech presentations. Also, a questionnaire was used to determine the differences in introspective reactions.

Findings.-- Major findings were:

1. Adult audiences presented an informative speech supplemented with visual aids learned significantly more, as measured by immediate recall, than did adult audiences presented the same informative speech without visual aids.

2. Adult audiences perceived an informative speech supplemented with visual aids as being at a significantly higher level of effectiveness than the same speech presented without visual aids.

CALDERWOOD, FRANCIS R. An analysis of Characteristics and Interests of Radio Listeners and Television Viewers in the Cleveland Area. Thesis, M.A., 1964, The Ohio State University. 146 p. Library, The Ohio State University, Colubmus, Ohio.

Purpose.-- The major purposes of this study were to determine: television and radio audiences preferences for various kinds of educational information and selected audience characteristics and to evaluate the above findings in relation to the effectiveness of television and radio as educational mediums and as Extension teaching methods.

Method.-- The information used as a basis for this study was secured from fifty personal interviews. Twenty-five were members of the television audience and twenty-five were radio audience participants. They were selected by random number table method from among those persons requesting telecourse study guides or Extension bulletin mentioned on television or radio broadcasts during one three-week period.

The first part of the schedule consisted of 120 program topics respondents rated on a 0 to 10 scale. The topics were equally divided into the following classifications:

"How to", topics that demonstrate a skill or procedure.

"Appreciation", topics telling more of the "why" and values related to a skill or procedure.

"Extension Non-related", topics important to continuing education, depth of understanding, and personal development but not presently within Cooperative Extension Service programming.

Respondents rated the topics in terms of their conception of personal interests and value to the community.

The second part of the schedule asked for reaction to present Extension programs, suggestions on adult education concern and personal characteristics and interests.

Findings.-- Characteristics of both audiences are similar. People are as interested in such subjects as Ohio's history, science, art, and understanding the mind of man as they are in subjects leading directly to a skill. They want information to strengthen democratic citizenship; family unity; and personal living. People want Extension programs to offer more subject matter detail and related to the broader interests and needs of the total audience.

People feel Extension programs offer meaningful objective information.

STEVENS, ANDREW LEE. The Use of Farm Magazines by Teachers of Vocational Agriculture. Thesis, M.Sc., 1964, The Ohio State University. 93 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- (1) To determine how teachers of vocational agriculture in Ohio used farm publications; (2) to identify reasons for using magazines, and (3) to obtain teacher reactions to certain magazines.

Method.-- A questionnaire consisting of checklists and open-end questions was prepared and mailed to all 309 teachers in Ohio; 155 usable replies were returned. One checklist pertained to specific articles in the January 18, 1964 issue of The Ohio Farmer magazine.

Findings and Interpretations.-- Sixty-three percent of the respondents used at least one of the selected articles from The Ohio Farmer. The most used articles were about farm policies, farmer experiences, technical information and new developments in agriculture. The teachers indicated a preference for articles written in a concise, easy-to-read language. Teachers demonstrated a preference for articles in a condensed form written by researchers. They indicated farmers would prefer farmer experience articles. Teachers rated general farm magazines more useful than specialty magazines for themselves and farmers.

One hundred eighteen of the teachers listed "to keep up to date" as their main reason for using magazines. Lack of time was mentioned by 49 of the teachers as a reason for not making more use of magazines.

More than fifty percent of the respondents listed student leisure reading and teacher reference as the major functions of magazines. Magazine reports and class references were mentioned by 46 and 42 percent of the respondents.

YOUNKMAN, CHARLES LEE The Training Needs of Ohio County Extension Agents for Using Television as an Effective Educational Medium. Thesis, M.A., 1964, The Ohio State University. 93 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- This study was designed to determine the felt training needs of county extension agents for using television as an effective educational medium. It was also designed to determine the status of agents' use of television.

Method.-- A mail questionnaire was sent to the 205 county extension agents in Ohio. It included face data, status of present television programming, felt training needs, and projected use of television. A scale was used to determine the felt training needs of agents in "On-camera Presentation Techniques," "Use of Visuals," "Selecting Subject Matter," and "Program Planning and Production." The statistical treatment of the data included percentages, ranking, and Mann-Whitney U test, and the Kruskal-Wallis analysis of variance.

V EVALUATION STUDIES

BRONSON, CLEMENT A. An Evaluation of Selected Aspects of Agricultural Education Programs in the Inter-Regional Land-Grant Institutions of the United States. Dissertation, Ph.D., 1963, The Ohio State University. 565 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- To ascertain the factors necessary to appraise the educational programs of the departments of agricultural education, to evaluate the teacher training programs as to their degree of helpfulness in preparing teachers of vocational agriculture, and to discover the strengths and the weaknesses and determine changes needed in programs of agricultural education.

Method.-- Data were taken from the literature of the various offices and authorities who had been responsible for development of teacher training in vocational education in agriculture. From these statements was developed a preliminary draft of a statement of position on each of ten selected aspects and sent to fifteen head teacher trainers who served as a "jury of experts." A modified draft from the returns of the preliminary draft, together with a questionnaire and an evaluation schedule was resubmitted for final adoption by the "jury of experts." The response was 100 percent. The agricultural education departments studied included fourteen inter-regional land-grant departments and one quasi land-grant department.

Findings.-- There was general agreement among head teacher trainers as to the major objectives of the agricultural education programs in inter-regional land-grant departments. These objectives were: (1) Recruiting Trainees, (2) The Training Curriculum, (3) Placement of Teachers, (4) "In-Service Teacher Education," (5) Research, (6) Administration and Supervision, (7) The Staff, (8) Instruction, (9) Institutional Facilities, and (10) Public Relations Activities.

The Guiding Statements of Positions identified in this study and which subsequently led to formulation of the evaluative criteria were operationally sound as a basis for evaluating the current programs of agricultural education departments.

The weakest areas of the total program of agricultural education departments were: (1) Research, (2) Recruiting trainees, and (Public relations activities. The strongest areas in the total program were: (1) The Staff, (2) The training curriculum, and (3) Institutional facilities.

The general status of these departments reflected that: (1) There were needs for increases in teacher training and secretarial personnel; (2) there was the need for a massive cooperative research program between agricultural education departments of the several States with the objective of improving total programs and solving reciprocal problems related to vocational agricultural education; and (4) there was the need for developing a systematic internal departmental evaluation program within each department.

Findings.-- Agents indicated the amount of training they needed was about the equivalent of a two-day workshop. There was no significant difference in the agents" training needs in "Selecting Subject Matter," "On-camera Presentation Techniques," "Use of Visuals," and "Program Planning and Production." However, agents with no television experience needed more training than agents with experience. The difference in the training needs of these two groups was significant in the areas of "Program Planning and Production," "Use of Visuals," and "On-camera Presentation Techniques."

Most agents' programs were prepared for the farm producer and were aired before 9:00 a.m. or at noon. Agents named extension specialists and television station personnel as primary sources of assistance in preparing their television presentations, which were designed to create awareness and to develop interest. The programs were primarily regularly scheduled or guest appearance presentations.

Agents indicated they would be using television more in 1974 than at present with "4-H and Youth," "Home Economics," and "Agriculture for the Home Owner" programs showing the most increase in popularity. The primary purpose of these programs would be to create awareness and to develop interest.

EGGENBERGER, ULRICH LEWIS An Analysis of High School Vocational Agriculture From Evaluations of Graduates in West Texas. Dissertation, Ph.D., 1964, Iowa State University of Science and Technology. 166 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- (1) To determine the present occupational status of West Texas high school graduates of 1953, 1954 and 1955 who had completed one or more years of vocational agriculture, (2) to determine factors related to occupational choices of graduates, (3) to evaluate the high school course areas and the vocational agriculture programs as related to the occupations of the graduates, and (4) to determine possible changes that could be made in vocational agriculture in order to meet the needs of male high school graduates.

Method.-- Data used in the study were secured from the permanent records of 45 West Texas high schools and from completed questionnaires obtained from 846 graduates (70.4 percent).

Findings.-- Twenty-eight and four-tenths percent (240) of the graduates were farm operators, 15.7 percent (133) were employed in farm-related occupations, and 6.4 percent (54) were in the military service.

The following factors were related to the occupational choices of the graduates at the one-percent level of significance when tested by use of the chi-square statistical method: occupation of the father, acres of land operated by the father while the son was in high school, years of vocational agriculture completed by the high school graduate, and the graduate's subsequent attendance at college. The scholastic rank of the high school graduate was significant at the five percent level.

Approximately three-fifths of the 846 graduates had attended college. One-half of those who had attended college had received a degree.

The graduates, not classified by occupation, rated the value of the high school course areas in the following decending order: mathematics, English, business and bookkeeping, speech, vocational agriculture, science, industrial arts, typing, and foreign language. The farm operators rated vocational agriculture second and those graduates in farm-related occupations rated it fourth.

The farm operators rated the value of the eight subject-matter units in vocational agriculture in the following descending order: crop production, farm management, farm mechanics, livestock production, soils, agricultural occupations, FFA leadership activities, and horticulture. The graduates in farm-related occupations rated soils and FFA leadership activities higher than did the farm operators.

The supervised farming program was rated "important" to the farm operators and those in farm-related occupations but of "little importance" to those in nonagricultural occupations.

Graduates who were in farm-related occupations or were farm operators received the most value from their FFA training, indicating its value as "important". The graduates in the three occupation groups who participated in FFA leadership contests rated the training as "important" in their present occupation.

EBBERT, J. MARVIN. The development of a Standardized Achievement Test for Small Gasoline Engine Instruction. Dissertation, Ph.D., 1964, Purdue University, 161 p. Library, Purdue University, Lafayette, Indiana.

Purpose.-- The purpose of this study was to develop a standarized, multiple-choice achievement test covering the fundamentals of operation, care, and maintenance of small gasoline engines.

Few, if any, standardized achievement tests in the field of agricultural education have been produced during the past twenty years. The author questioned many of the reasons set forth as deterrents to the development to such tests.

Method.-- In response to requests, 75 vocational agriculture teachers in Indiana high schools indicated an interest in cooperating in the test development project. Following the development of a list of operational objectives, a unit outline was developed. The objectives and outline, along with a suggested time allotment for accomplishing the objectives and teaching the indicated content, was submitted to a panel. Following approval and modification of these objectives and outline, the task of writing items was completed. These, also, passed through a process of modification and approval. The items were written in accordance with a table of specifications.

Since a final suggested form that could be administered in one 50 minute school period was desired, a preliminary form of 175 items that could be administered in two 50 minute periods was designed.

Findings.-- Following the administration of the test in 68 schools, the results were item analyzed. A refinement process was accomplished whereby 100 items were selected which met the 5 percent level of significance in both the item analysis sample and a sample reserved for cross validation purposes. The suggested final form was presented with norms based on a combined group of 565 Indiana sophomore and junior vocational agriculture students and based on 337 Indiana senior vocational agriculture students.

If this test is found valuable to teachers of agriculture, it should be considered sufficient reason for agricultural educators to look anew at the lack of development of standardized tests in agricultural education. It might also indicate that such tests should be given more consideration in other areas of vocational education.

The test might serve as a basis for studies in farm mechanics with emphasis on such problems as:

1. The proper balance between laboratory and classroom instruction;

2. The influence of instruction that is project centered versus that which is not;

3. The effectiveness of various methods of teaching and teaching materials in the small engines area.

The graduates who were farm operators and who were in farm-related occupations rated the value of agricultural judging contests considerably higher than did those graduates in nonagricultural occupations. Graduates who were farm operators had greater participation and recieved more value from training received in fitting and showing livestock than did the other groups.

LINSON, MARVIN G. A Guide for Self-Evaluation of State Supervisory Programs in Vocational Education in Agriculture. Dissertation, Ph.D., 1964, The Ohio State University. 203 p. Library, The Ohio State University, Columbus.

Purpose.-- The central purpose of this study was to develop a guide for the self-evaluation of State supervisory programs of vocational education in agriculture as a basis for program development and improvement.

The following specific objectives were identified to give further direction to the study: (1) to design an instrument to assist State supervisors in self-evaluation of their supervisory programs of vocational education in agriculture.

Method.-- In developing the self-evaluation instrument, a set of statements was developed which were designed to be "indicators" of successful implementation of guiding principles of State supervision of vocational education in agriculture.

Two national juries of experts in educational supervision assisted in refining the indicators and evaluating their importance to the effective implementation of the guiding principles.

A set of procedures was developed for using the self-evaluation instrument. The instrument and suggested procedures were used by the State supervisory staffs in five states to evaluate their State supervisory programs.

Findings.-- The responses from the trial states indicated that the instrument was helpful in bringing about changes in the supervisory programs of the trial states.

It was also concluded that the self-evaluation instrument had procedures developed by this study may appropriately be used by other State supervisory staffs of vocational education in agriculture as a device for assessing their supervisory programs; that the use of the instrument and procedures for the self-evaluation of State supervisory programs is an effective means of bringing about change in State supervisory programs of vocational education in agriculture; and that the 121 indicators listed in the self-evaluation instrument identify the major activities of an effective State supervisory program of vocational education in agriculture.

LOVELY, CORBETT A Study To Identify Selected Accomplishments of the Piketon Vocational School in Terms of Its Stated Purposes. Thesis, M.A., 1964, The Ohio State University. 122 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purposes of this study were to determine selected educational agricultural, social, and occupational patterns in Pike County which were important to provisions for vocational education. Also, to determine the purposes and accomplishments of the school and the satisfaction of the students and graduates with the vocational training it provided.

Method.-- Specially prepared questionnaires were submitted during March of 1964 to one hundred seventy-five 1963-64 vocational students and 190 graduates. The students were asked advantages and disadvantages of the vocational training, other courses preferred over the ones they were taking, and whether they thought the training would help them secure and hold a job.

The graduates were asked advantages and disadvantages of the vocational training, additional training taken since graduation, jobs held, advancement on the job, occupations desired for their life's work, and whether they would take vocational training again if they had it to do over.

The data were carefully tabulated, analyzed, and summarized.

Findings.-- The vocational school was established to provide more comprehensive course offerings to high school students and to teach students necessary skills for the manpower requirements in the occupations they planned to enter.

Three-fourths of the 1963-64 students received the training desired. Over two-thirds of the graduates stated the training gave them a better opportunity to secure and hold a job. A high proportion of the students came from farm homes. In general, the students and graduates were satisfied with the vocational training provided.

The major disadvantages of the vocational school from the students' standpoint were: lost contact with home high school, scheduling difficulties, and lack of satisfactory facilities.

VI EXTENSION STUDIES

CRAINE, JOHN EDWARD The Development of a Lamb Promotional Program in Cooperative Extension Work in Greene County, Ohio. Thesis, M.Sc., 1963, The Ohio State University. 79 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- This study explored the use of local educational committees in conducting effective lamb promotions, and recorded attitudes of people involved in the activity toward lamb and the promotional procedure used.

The specific objectives of this study were as follows::

1. To identify how lamb producers can cooperate in a lamb promotional program.

2. To identify the effective phases of the present educational lamb promotional program.

3. To identify the extent to which lamb sales have increased locally as a result of lamb promotional efforts in Greene County, Ohio.

4. To identify attitudes of local producers, retailers and consumers toward a lamb promotional procedure.

5. To identify attitudes of wives of sheep producers regarding their participation in the lamb promotion.

Methods.-- The case study method of research was used for this study involving two lamb promotion activities conducted in two supermarkets in Xenia, Ohio, in 1963. Respondents in the study included sheep producers and their wives, retail store personnel and consumers. The data were collected by personal interview, observations, recorded group evaluation, and lamb sales records of the supermarkets involved in the study.

Findings.-- Lamb producers can plan and conduct successful lamb promotional activities. The procedure used and the involvement of producers contributed to their understanding of lamb marketing and the success of the promotion. The activity increased lamb sales in the two supermarkets cooperating and their management were pleased with the cooperative effort.

Tasting lamb was the key to whether people liked lamb. The reaction of food shoppers towards lamb and lamb quality indicated that producers have a challenge through research and selective breeding to improve the acceptance of lamb as a stable meat item.

CUNNINGHAM, CLARENCE J. Measures of Leader Behavior and Their Relation to Performance Levels of County Extension Agents. Dissertation, Ph.D., 1964, The Ohio State University. 187 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- To develop an instrument which would measure the leader behavior dimensions of consideration and initiating structures as applied to county Extension agents and to determine whether the leader behavior dimensions were sufficiently related to performance for the instrument to be used in selection and placement of agent personnel.

Method.-- Adapting from the Leader Description Questionnaire, the author developed three experimental scales which were purported to measure leader behavior. The instrument which was most valid in measuring leader behavior was then completed on self by 185 county Extension agents which included agents in agriculture, home economics, and 4-H. The immediate supervisor completed the same questionnaire for each county agent.

The results from the use of the instrument determined four agent classification groups. These groups were then compared for significant differences in personnel performance scores by using the analysis of variance.

Findings.-- The new instrument was fairly reliable when Extension agents were described by supervisors, but was not reliable when used by agents as a self-description scale.

When only the data secured from descriptions by supervisors were used, it was found that the county Extension agents who performed most efficiently were those above the median on both dimensions of leader behavior, "initiating structure" and "consideration." The leader behavior theory upon which the study was based was thus supported.

The effective Extension agents performed at a high level regardless of the leader behavior of the other agents working with them.

GARMAN, GEORGE J. A Study to Determine "County Extension Agents' Perception of Needed 4-H Program and Procedural Adjustments When 4-H Enrollment Increases to 5,000 Members in Ohio Counties". Thesis, M.S., 1962, The Ohio State University, 141 Fyffe Road, Columbus, Ohio 43210.

Purpose.-- This is described in the thesis title and was based upon the premise that Ohio County Agent staff would remain at three even when enrollment reached 5000 members.

Method.-- Mail questionnaires were went to 220 Ohio County Agents who had been on the staff one or more years. One hundred seventy-four questionnaires were returned.

Data from all responses was transferred to IBM cards for processing. Data was processed 1) for all agents. 2) for agents by position. 3) for agents from high and low enrollment counties.

The questionnaires were divided into 11 areas of concern. Agents were requested to rate 35 items as they appraised them for their present enrollment and then as they forsee them with the 5000 enrollment.

Spearman's statistical formula for Rho was used to establish rank-order-correlation.

Findings.-- The data indicate that agents will become administrators of the program and have less contact with advisors than at present.

Local club organization, recruiting and training 4-H advisors and members and in project subject matter will be performed more by 4-H advisors, local people, lay committees and 4-H Council than at present.

Agents perceived continued importance on 4-H records and reports and county-wide activities. Less importance was placed on compulsory exhibiting by members.

Awards and recognition of members and advisors received high rating by agents. Junior Leaders was perceived of more importance with the high enrollment.

General conclusions are that Ohio agents feel it would be impossible for a three agent team to service a county 4-H enrollment of 5000 without major changes in procedure. They indicate more assistance will be needed from state staff, local people, clerical workers, part time semi-professional summer help, more office equipment and facilities for county-wide activities.

McNABB, COY GAYLORD. The Administrative Role of the County Extension Director in Missouri. Dissertation, Ph.D., 1964, The Ohio State University. 205 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- This study was concerned with the administrative role of the county Extension director in Missouri as perceived by county directors, other county staff, and the state administrative staff of the Extension Division, University of Missouri. The primary purpose was to determine the degree of consensus among and between position groups. A secondary purpose was to determine the difference between the role expectations held by county staff members with high job satisfaction and those with lower job satisfaction.

Method.-- Data for the study were obtained from a questionnaire completed by 105 county Extension staff members in 30 Missouri counties (randomly drawn), plus 13 members of the state Extension staff. The questionnaire consisted of four parts: face data, role expectations instrument, role performance instrument and a job satisfaction scale. Four statistical tests were run: the difference between percentage test for uncorrelated data, Wilcoxon matched pairs-signed ranks test, Spearman's rank order correlation, and the t test.

Findings.-- Some the the major findings were that there was a high degree of consensus among county directors, a high degree of consensus between county directors and the state administrative staff, and a high degree of consensus between county directors and the other county staff on a majority of the role expectation items. However, on certain specific items there was a definite lack of consensus between the position groups.

County directors had the greatest intrapositional consensus followed by the state administrative staff and the county staff in that order.

Another finding of interest was that county directors, to a greater extent than the other county staff, felt they were suggesting new ideas or new approaches in programs of other county staff members and that they were encouraging and making use of suggestions given by other county staff members.

The other county staff members were not well informed about the rights and obligation of the county director in the area of personnel management concerned with recommendations for salary increases, promotions and dismissals of other county staff members.

Finally, county staff members with high job satisfaction scores felt that the county director was obligated to exert stronger leadership than those scoring lowest on the job satisfaction scale.

VII FARM MECHANICS STUDIES

GEORGE, WILLIAM C. A Study of Farm Mechanics Jobs Taught by Teachers of Vocational Agriculture in Missouri. Dissertation, Ed.D., 1964, University of Missouri. 252 p., Library, University of Missouri, Columbia, Missouri.

Purpose.-- The purpose of this study was to determine what farm mechanics jobs are being taught in the day classes of Missouri high schools with departments of vocational agriculture.

Method.--Data relating to the programs of vocational agriculture were obtained by means of an information form sent to the 254 teachers of vocational agriculture for the school year 1962-63. The form was based on the list of farm mechanics jobs as issued by the State Department of Education, Jefferson City, Missouri.

Findings.-- Forms were returned by 175 of the 254 teachers. There were 16 subject matter areas with 73 farm mechanics jobs listed on the form. The teachers indicated that their mean present teaching program for the 16 subject matter areas was 29.4 periods for farm engines and tractors, 21.8 for woodworking, 17.4 for farm machinery, 17.4 for electric arc welding, 14.3 for farm electricity, 10.6 for oxy-acetylene welding, 9.2 for cold metal work, 8.9 for forge work, 6.5 for farm plumbing, 5.8 for farm structures, 4.6 for the farm service center, 4.6 for farm painting, and 3.4 for fencing.

The mean suggested program as indicated by the teachers included 35.1 periods for farm engines and tractors, 24.0 for woodworking, 20.7 for farm machinery, 18.8 for electric welding, 16.0 for electricity, 12.3 for oxy-acetylene welding, 10.8 for concrete and masonry, 10.6 for tool sharpening, 10.1 for cold metal work, 8.7 for farm plumbing, 1.7 for farm structures, 7.0 for forge work, 5.3 for the farm service center, 4.9 for farm painting, 4.8 for soldering, and 4.1 periods for farm fencing.

The teachers indicated a number of reasons for changing their programs. Twenty to 33 teachers indicated a need for further training in 10 of the 73 jobs, while 10 to 19 teachers indicated such need in 30 of the 73 jobs.

Twenty to 44 teachers indicated a lack of facilities as a reason for not teaching 13 of the 73 jobs, while 10 to 19 teachers indicated this reason for 22 of the 73 jobs. Twelve to 27 teachers indicated no need in the community for teaching 6 of the 73 jobs. Twenty to 43 teachers indicated a lack of time as a reason for not teaching 35 of the 73 jobs, while 10 to 20 teachers indicated this reason for 26 of the 73 jobs.

JOHNSON, RAMSEY PAUL A Study of Farm Machinery Maintenance Activities in the Blue Earth, Minnesota Community. A Colloquium, M.A., 1963, 53 p. Department of Agricultural Education, University of Minnesota, St. Paul, Minnesota.

Purpose.-- To identify the investment in machinery and maintenance cost, the type of work done in maintenance of machinery on the farm and that done by commercial businesses, the facilities and equipment available for machinery maintenance, and the need for, and use of, the farm mechanics laboratory of Blue Earth high school for instructional programs of machinery maintenance.

Method.-- A random sample of sixty farmers was selected from 200 farmers in school district area. The six farm machinery dealers were also sampled. The farmer survey form consisted of thirty questions covering forty-eight items. The farm machinery dealers survey form consisted of sixteen questions requiring thirty-five answers. All participants of this study were personally interviewed by the writer. The corn planter, mower, grain drill, plow, combine, corn picker and hay baler were major machines involved in the study. Additional data were secured from census reports and other published materials.

Findings and Interpretations.-- Investment per acre averaged $40.11 for the sixty farms. For the average farm of 281 tillable acres the yearly repair expenses on crop machinery was $472.55 or $1.68 per acre. Thirty-seven percent of the farmers said they could reduce these expenses.

The average farm of this study had about 2266 square feet of machinery storage area. Forty-five percent of farms had adequate facilities to store all crop machinery. Forty-three percent of farmers used a portion of storage area for machinery maintenance and repairs. Only twenty percent of this group said they used this space during winter months. About 95 percent of farmers indicated they had adequate tools and equipment for maintaining their equipment. Sixty-seven percent of farms had either arc or oxy-acetylene welders.

Thirty-five percent of farmers had received high school diplomas, but thirty percent had received only an eighth grade education. Seventy-eight percent of farmers said they would be interested in a special series of classes on maintenance and adjustment of machinery. Fifty percent of farmers had attended special machinery schools in the area, but about ninety-three percent of this group said "schools" were of limited practical value and contained too much advertising.

The present farm mechanics laboratory space for machinery instruction is about 60 percent of recommended space needs of 150 square feet per student. Actual space available for machinery is only 486 square feet due to present placement of power equipment and work benches. A shop door width of 10' 4" limits the size of machinery that can be brought in.

ROBINSON, NORMAN LYLE Competencies in Farm Machinery Maintenance Needed by Farmers. Thesis. M.S., 1964, Iowa State University of Science and Technology. 88 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To determine the competencies in farm machinery maintenance, repair and adjustment needed by present and prospective farmers.

Method.-- A group of key farmers, those classified as outstanding in the use of farm machinery, identified the necessary competencies needed by farmers in farm machinery maintenance, repair and adjustment of 12 farm machines. A questionnaire developed from this list was submitted to 300 farmers who were graduated from Iowa high schools from 1950-1954, and to 300 farmers who were very proficient in the use of farm machinery. For brevity, competencies pertaining to only four of the original 12 machines (tractors, plows, corn planters and mowers) were included in the questionnaire. Farmers evaluated (1) the degree each competency was needed in order to properly maintain, repair and adjust farm machines, and (2) the degree to which each competency was possessed. The first 200 usable questionnaires returned by each group made up the final sample (400). Responses indicating degree of competency needed and possessed were analyzed using mean scores.

Findings.-- Highest overall scores for competency needed for both groups were found for the competencies of tractor overhaul, adjusting tractor overhaul, adjusting tractor hydraulic systems, and adjusting and overhauling tractor carburetors. There was a significant relationship observed between the degree of competency needed scores given by the outstanding farmer group and those given by the 1950-1954 graduates, as indicated by a Spearman rank order coefficient of correlation of .993.

The outstanding farmers indicated they possessed the most competence in replacing tractor oil filters, adjusting corn planting rates and providing tractor battery maintenance. The 1950-54 graduates reported the most competency possessed in replacing the tractor oil filter, cleaning the tractor air cleaner and providing battery maintenance.

A need for more competence than they possessed was indicated by the outstanding farmers for 16 of the 47 competencies, and for 14 of the 47 by the 1950-54 graduates. In the areas where the outstanding farmers felt a need for more competence than they possessed, competencies showing the greatest mean difference were: performing a complete tractor overhaul, and hammering out worn plow shares. Competencies with greatest mean differences for the 1950-54 graduates were: hammering out worn plow shares, and hard-surfacing plow shares.

The top ten machine competencies, as rated on the basis of competency needed by the outstanding farmers, were identified, and the highest competency mean, performing a complete tractor overhaul, was tested for significant differences between the other nine means by use of the t-test. Computed t-values showed five combinations to be highly significant for the outstanding farmers and three for the 1950-54 graduates. Eight combinations were significant at the 5 percent level.

SWEANEY, H. PAUL. An Evaluation of Two Methods of Teaching Agricultural Mechanics. Staff Study, 1964. Michigan State University. 48 p. Mimeograph, Department of Secondary Education and Curriculum, Michigan State University, East Lansing, Michigan.

Purpose.-- To determine if differences were significant between the outcomes of instruction in agricultural mechanics taught in integrated courses and the outcomes when taught in a separate course in one year.

Method.-- Students enrolled in departments of vocational agriculture considered above average in the quality of instruction in agricultural mechanics in Michigan were grouped according to the time when instruction was offered in the secondary curriculum. Areas of instruction and specific content within areas were obtained to identify what was common to either method of scheduling. A test of understanding of scientific principles was developed covering common instructional units. The areas of instruction used were concrete, electricity, welding, power and machinery, and the home farm shop.

A performance test involving skills commonly taught to both groups of students was developed and administered in seven centers throughout the State. The size of shops limited the number of students that could be tested at a center. A sample of students from groups which had taken the test of understanding was drawn so that students from all four quartiles would be included in the test of skills in agricultural mechanics. College staff members in agricultural engineering assisted in the testing program in all centers. Since schools offering instruction in agricultural mechanics in separate courses commonly offered it to tenth grade students, twelfth grade students who had enrolled in separate courses in previous years were also included as well as those currently enrolled.

Findings.-- There were no significant differences in understanding of mechanical principles between students who had received their instruction in agricultural mechanics in separate courses and seniors whose instruction was integrated with other instruction in vocational agriculture. Seniors who were enrolled in separate courses in previous years were significantly higher in their understanding of mechanical principles than sophomores currently enrolled in separate courses.

Twelfth grade students who previously studied agricultural mechanics in separate courses were significantly higher on tests of performance than were sophomores currently enrolled in separate courses and also higher than seniors who had received their instruction integrated. Seniors enrolled in integrated instruction were higher than sophomores or seniors currently enrolled in separate classes in agricultural mechanics.

Schools wishing to offer a separate course in agricultural mechanics should expect students to achieve as much understanding as those in integrated courses. Students, particularly sophomores, who received their instruction in separate courses may not perform on as high a level of skill as seniors, but they seem to be able to compare favorably or are higher when they become seniors.

VIII FARMING OPPORTUNITIES STUDIES

CHAMBERLAIN, HERBERT D. Number and Nature of Farming Opportunities in the Jackson City School District. Thesis. M.S., 1963, The Ohio State University, 61 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study is to determine the number and the nature of farming opportunities that are available for new operators in the Jackson City school district.

Method.-- A questionnaire containing twenty-two items was developed to be used in interviewing selected farm operators. Sixty interviews were conducted with operators selected from a list of farmers living in the Jackson City school district. The writer used a random sample, selecting every seventh farmer for the interview.

Findings.-- The operators in the study had an average age of 47 years. The range in age was 24 to 78 years.

Results of the study showed that operators interviewed lived on farms that averaged 159 acres. Sixty-one percent of the operators under 44 years of age operated 160 acres or less.

Twenty operators were classified as part-time since they worked off the 100 farm days or more each year. These operators operated a total of 2,128 acres averaging 106 acres in size. The 40 full-time farmers in the study farmed a total of 7,212 acres or an average of 185 acres each.

Size of farm and net farm income were compared and it was shown that 23 percent of the farms under 240 acres reported net incomes of $2,500 or more, whereas 58 percent of the farms over 240 acres reported net farm incomes of $2,500 or more.

Net farm income and the educational level of the operators was compared and it was found that 90 percent of the operators with less than four years of high school had net farm incomes of less than $2,500. Fifty percent of the operators with high school and/or college reported net farm incomes of $2,500 or more.

Fifty percent of the operators in the study had a high school education and 38 percent had eight years or less of school.

Sixty-one percent of the operators farming 10 years and less had graduated from high school and/or attended college, whereas, only 45 percent of the operators farming 11 years or more had graduated from high school.

Information in the study indicated that there would be as many as 10 new opportunities each year by retirement of farmers in the Jackson City school district.

Further information indicated that there would be 5.5 opportunities due to death of farm operators in the Jackson City school district.

GANZEL, RONALD W. A Study to Determine the Number of Farming Opportunities Likely to Become Available in the Pawnee City School Patronage Area From 1963-1973. Thesis M.S. 1964, University of Nebraska, 57 p. Library, University of Nebraska, Lincoln, Nebraska.

Purpose.-- To analyze the number of farming opportunities that will become available in the Pawnee City school patronage area. The specific factors considered were: 1. The number of such farming units likely to become available through death, retirement or migration; 2. Plans of present farmers for retirement, consolidation of migration from present units, thus rendering them available as opportunities for new operators; 3. Acreage and income required for a satisfactory level of living; 4. Farming enterprises or combinations of enterprises in the area most likely to provide a desired level of living.

Method.-- Information was secured by a questionnaire from fifty percent of the 286 farmers residing in the school patronage area.

Findings and Interpretations.-- Seven methods were used to determine the number of farming opportunities that would be available to new operators by 1973.

Method A, using simple projections of death, retirement, change of occupations and consolidation figures showed 25.4 farms would become available.

Method B, consolidating farms into economic units producing gross incomes of $10,000 or more indicates that at the end of the ten year period 37.5 of the present farmers will still be surplus operators in the area.

Method C, farmers willing to help finance a young man showed 32 farms will be available.

Method D, projection of death, retirement at age 65, change of occupation and consolidation figures of the area revealed that 82.2 farms will become available.

Method E, death rate and retirement and change of occupation intentions of farmers with income adjusted to $10,000 showed 77.2 farms becoming available to new operators.

Method F, projecting death rate and retirement and change of occupation intentions of farmers with acreages adjusted to size of operation to yield at least a $10,000 gross income resulted in 79.5 farms to become available as farming opportunities.

Method G, projections of death, present plans of Pawnee City school patronage area farmers to retire, change of occupation and the consolidation rate of the area will yield 58.2 farms.

Based upon the findings of this study it was concluded that:

1. An average of six or more farming opportunities are likely to become available each year.

2. A farming opportunity is not dependent upon the amount of land or livestock but upon the management by the operator. Therefore, the potential number of farming opportunities is greater than that indicated by any of the above methods.

HELT, LAWRENCE FRANK How Young Farmers Become Established in Farming in the Mohall, North Dakota, Community School District. Thesis, M.A., 1964, University of Minnesota. 110 p. Library University of Minnesota, St. Paul, Minnesota.

Purpose.-- To determine methods and means utilized by young men toward establishment in farming. The community opportunities in farming, educational background of young farmers, cumulative financial growth, family farm estate transfer plans and future vocational needs were appraised.

Method.-- A complete survey of the 126 active farmers in the Mohall Community School District furnished data for determining local opportunities in farming. From these data, 36 young farmers who had started farming between the years 1950-1962, inclusive were interviewed by the investigator relative to their establishment in farming.

Findings.-- It was found that in the next 10 years, 31 percent of the farmers plan to retire vacating an average of 5.7 farms per year. Allowing 10 percent for consolidation, 5 farms whould be available to prospective young farmers in the community each year.

The decision to farm was made at age 16½ while average age at establishment was 22, just one year after marriage for 91% of the young men. Chief factors influencing farming career decision were: like farming, advantage of farm experience and independence of employment. Major problems encountered toward establishment were need for land and capital.

Farming status patterns initially included 72% partnerships, 22% share tenancy, 3% cash tenancy and 3% part farm ownership. Present farming status finds 33% part farm owners, 28% partnerships, 25% share tenants, 11% full farm owners and 3% cash tenants.

Necessary working capital invested prior to establishment averaged $5,050 for 18 young farmers while 16 others invested $5,917 each their first year in farming. Supplemental earnings of $2,660 on the average were realized by 24 of the young farmers who sought additional employment.

The young farmers accumulated a greater amount of net worth in farming status compared to non-farm employment. A range from $6,154 for part farm owner, followed by full farm owner, partnership-other, share tenant, partnership-father and to cash tenant at $2,400 per year were average annual increase in net worth. The young farmers changed within these 6 farming status steps an average of 2 times over the 10 year period spent in farming.

Parents and relatives holding mortgages represented 58% of the help in locating land to farm while 47% of the 16 young farm land owners used the contract for deed acquisition method. These 16 men averaged $19,162 of credit to buy land of which 70% was received evenly from private party sources and Farm Home Administration. Parents sold the home farm to a son in 31% of total estate transfers while 28% included provisions in a will; another 28% had not made any personal will as yet.

Indications gained from this study reveal that a great deal of stress should be given to encouragement of gradual transfer of equity in land and farm business through legal and well planned father-son partnership contracts.

IX FOLLOW-UP OCCUPATIONAL STUDIES

ADAMS, RICHARD NEIL. **An Analysis of High School Pupils Who Did Not Complete Their Program of Vocational Agriculture.** Thesis, M.A., 1964, The Ohio State University. 133 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to determine the major problems associated with pupils dropping vocational agriculture prior to completion of the program offered.

Method.-- The drop-out pupil was considered as the pupil who had enrolled in vocational agriculture, but had withdrawn during the academic school years concerned with the study. The names of the drop-outs were secured from the final occupational experience reports filed in each of the five vocational agriculture departments in Clark County. These pupils' names were verified by checking the permanent records in each of the five school offices.

Information was secured from the drop-outs by means of a self-returning questionnaire or a personal interview based on the questionnaire. Each teacher who had taught in Clark County during the period studied was interviewed.

A case record was compiled for each drop-out responding to the questionnaire.

Findings.--

1. Of the pupils enrolled for the period under study 8.8% dropped vocational agriculture.

2. Fifty-one % of the drop-outs withdrew from vocational agriculture at the conclusion of their first year in the program.

3. Forty-one% of the drop-outs were graduated from high school indicating they had the academic ability to complete vocational agriculture.

4. All the drop-outs had an inferior occupational experience record except one. This was true at all grade levels at all of the schools.

5. The predominant reasons given by the drop-outs for enrolling in vocational agriculture were:

(a) Interested in vocational agriculture (32.2%)
(b) To train for a vocation (21.5%)
(c) Advised by a friend (13.9%)
(d) Advised by the vocational agriculture teacher (11.8%)
(e) To belong to the FFA (11.8%)

6. The predominant reasons given by the drop-outs for dropping vocational agriculture were:

(a) Changed vocational plans (18.3%)
(b) Schedule conflict (15.0%)
(c) Lack of opportunity to develop an occupational experience program (15.0%)
(d) Insufficient time to carry an occupational experience program (13.3%)
(e) Quit school (13.3%)

BENEKER, FLOYD D. The Realization of Plans by 1957 Male High School Graduates in Five Wisconsin Counties as Measured by a Comparison of Residential, Occupational, and Educational Classification. Thesis, M.S., Department of Agricultural and Extension Education, University of Wisconsin, Madison, Wisconsin. June, 1964. 105 p.

Purpose.-- The purpose of this study was to assess the realization of occupational aspirations of 1957 graduates of five representative Wisconsin counties. A secondary, but interrelated, purpose was to determine migration of respondents from the home community to obtain a job or further their education.

Method.-- The group studied consisted of the 1957 male graduates of the following five Wisconsin counties: Adams, Iowa, Manitowoc, Polk, and Price. Data from 538 respondents were studied.

Data used in the study were gleaned from a series of four questionnaires which had been administered between December, 1956 and August, 1963. All data were placed on IBM cards and electronically computed. For the purpose of this study, descriptive techniques such as percentages and arithmetic means were primarily relied upon to analyze the data. Chi square was figured on several relationships to determine significance.

Findings and Interpretations.-- More farm youth had not received formal education beyond high school than non-farm youth. The non-farm group had more individuals who had completed or were pursuing college educations and vocational training than the farm residence group.

Indecision about staying in the home community was very prevalent even two years after graduation with nearly half of the respondents undecided about staying. By 1963 it was determined that 56.9 percent of the respondents had migrated from the home community. Migration for the farm and non-farm group was essentially the same being separated by only one-tenth of one percent.

Manitowoc county retained the largest percentage of its respondent population and Polk county had the lowest retention. Manitowoc county being highly industrialized and Polk county being near the Minneapolis-St. Paul, Minnesota industrial area may explain the observance of migration.

County-to-county migration within the state accounted for the largest number of migrants and was followed by out-of-state intracounty and out-of-county migration in that order.

A large portion of the migrants had some college experience or vocational training. Sixty-four percent had some form of formal education beyond high school.

Over three-quarters of the respondents consider their jobs permanent. However, less than one-third of the respondents had attained the occupation which was their ten year goal. In 1958 the respondents were asked what occupation they wanted to be in by 1968. The lowest realization of occupational desires occurred in the classifications of manager, officials, and proprietors, sales and clerical and professional, technical and kindred.

A much larger proportion of the respondent population were engaged in skilled, semi-skilled and unskilled occupations than had desired to be by 1968. Also, a much larger proportion of the population aspired to professional, technical and kindred occupations than national employment levels in this classification.

The number of respondents actively engaged in farming in 1963 amounted to 25 individuals or 36 percent of those who hoped to be farming by 1968. When compared to national figures the proportion of this study population engaged in farming was still over twice the national percentage.

BOEHM, CARL ALTHAUSER An Occupational Survey of Former Students of Barnesville Not Farming and Implications for Improving the Program of Vocational Agriculture. Masters Problem, M.E., 1964, The Ohio State University. 99 p. Department of Agricultural Education, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to determine the occupational objectives of former non-farming students at Barnesville High School during the years 1949 to 1961 inclusive, to determine factors affecting their decisions not to enter farming, to identify aspects of the program beneficial to them in their 1960 occupations, and to evaluate those suggestions for improvement.

Method.-- The method used in obtaining information was a questionnaire sent to 91 former graduates. There were responses from 59 men for a 65.5 percent return.

Findings.-- The results of the information compiled showed 62.8 percent of the former students were engaged in unrelated occupations, 15.2 percent in fields of related occupations and 22.0 percent in part time farming.

Reasons for graduates not entering farming were lack of opportunity, the large investment needed for farming, low farm incomes, the large farms needed for an economical unit, and opportunity in other fields. Other factors were unfavorable attitudes of parents toward farming, size of home farm, supervised farming program lacked income, and lack of machinery owned by graduates.

There were 76.3 percent that would enroll in vocational agriculture again. Record keeping, shop instruction, and Future Farmers of America were most beneficial to former graduates in their occupations. Certain personality traits and aptitudes, such as resuming responsibility and being dependable, were developed to a certain degree in vocational agriculture and were useful to these graduates in their present occupations.

JONES HOWARD E. Occupational Trends of Graduates of the Vocational Agriculture Department of Muscoda High School 1953-1962. Seminar Report, 1964. University of Wisconsin. 31 p. Agriculture and Extension Education Department, University of Wisconsin, Madison, Wisconsin.

Purpose.-- To determine the present occupational status of the 1953-1962 vocational agriculture graduates of the Muscoda High School. With this information as a guide the high school curriculum in vocational agriculture might be revised to aid future Muscoda graduates in securing an occupation in related agriculture and still retain a vocational program for boys who return to the farm.

Method.-- Departmental records were used to obtain the names of graduates having three or more years of vocational agriculture. A questionnaire was used to obtain data from graduates. Graduates were asked to indicate present occupation, job satisfaction, value of agriculture training, and subjects in which graduates desired more training.

Findings.-- It was found that twenty-eight percent of the graduates were engaged in farming and thirty-six percent in related agriculture. Twenty-nine percent were engaged in non-related agriculture and seven percent were in the Armed Forces.

Seventy-four percent of the graduates who were in related agricultural occupations have entered into the fields of forestry, farm service, livestock, professional and farm machinery sales and services. In contrast, the twenty-five graduates who were engaged in non-agricultural occupations were employed in twenty different fields.

Eighty percent of the graduates engaged in farming and related agriculture felt their agricultural training was of very much or much value in their present occupations. All of the graduates in non-related agriculture felt that their agriculture training was of some to no value.

It was found in course evaluation that more training should be stressed in agriculture mathematics and science.

It was concluded that the largest percentage of the graduates in this study were engaged in farming and related agriculture. Muscoda High School agriculture program must continue to upgrade its curriculum.

PAUTZ, NORMAN A. A Comparative Occupational Study of Male Graduates of Chilton High School, Seminar Report, M.S., Department of Agricultural and Extension Education, University of Wisconsin, Madison, Wisconsin. May 1964,

Purpose.-- The purpose of this study was to categorize the occupational choices of the male graduates of Chilton High School for the past three decades. The study was also designed to show the relationship of I.Q., class rank, class selection and time of graduation upon the selection of occupation as being agricultural or nonagricultural.

Method.-- The group consisted of every third male graduate of a three decade period in Chilton High School, Chilton, Wisconsin. Graduates in the study numbered two hundred and seventy.

Materials for the study were in part taken from the Chilton High School records and the remainder via cards, letters, phone contacts, and any other means deemed feasible to get the information.

Consolidation of information was done on McBee Cards that had all information keyed to a master card.

Measured mental ability scores for students were from prior results of the Henmon-Nelson test of mental abilities.

Findings and Interpretations.-- Several characteristics were considered to determine the selection of an occupation with particular emphasis on agriculture and related fields. The following results were obtained:

Class Rank: Class rank in this study proved to be one of the poorest criteria by which to forecast future occupations. Students with talent may not work hard in school and tend to rank low, whereas students with less talent may be serious and work very hard, ranking higher. This may account in part for the fact that some rural students may have worked hard and ranked in the upper ten percent of the class and who are presently farming.

Mental Ability: Mental ability as based on I.Q. appeared to be a pretty good guage by which to later categorize occupations. Generally, the lower mental groupings were in the less skilled occupations and those of high mental abilities were primarily professionals. Farming in this study drew almost equally from all mental groupings. The largest total number of those evaluated in farming came from the middle or 90-129 ranges.

Decade Graduated: Decade graduated did affect the choice of present occupations and the selection of agriculture. The 1940's proved to be the most favorable time for agriculture in school and as an occupation. The number selecting agriculture today is about steady, but percentage-wise it has gone down.

Class Selection: Urban boys who took agriculture frequently became involved in agriculture. Rural boys who selected agriculture generally farmed or were in related occupations. Generally speaking both rural and urban boys who do not select agriculture also did not become involved in agriculture. The author noted, of course, exceptions here, the most notable perhaps was that forty percent of the rural boys who did not take agriculture still became involved in agriculture.

ROBINSON, TED RICHARD Factors Related to the Occupations of Iowa Farm Male High School Graduates. Dissertation, Ph.D., 1964, Iowa State University of Science and Technology. 257 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To investigate the relationship of selected factors to the occupations of Iowa farm male high school graduates during the period of 1950 to 1954. Specific objectives were to determine (1) the relations between the graduates' occupations and the geographical location of their high schools, (2) the relations between the graduates' occupations and selected characteristics of their home environments, (3) the relations between the graduates' occupations and their educational backgrounds, and (4) some measures of the occupational status of the graduates.

Method.-- Selected educational, environmental, occupational and ability data were obtained from the records of 165 Iowa high schools and from questionnaire responses from 5722 former graduates (71.61 percent) of these high schools. The selected high schools had offered an approved three or four year vocational agriculture program to the members of at least one of the graduating classes from 1950 through and including 1954. Graduates included in the study were those whose fathers were farmers on the day of their graduation or who had been farming during most of the time that the graduates were in high school, and others who had completed six or more semesters of vocational agriculture.

Apparent biases resulting from differential response rates by the graduates classified according to their high school graduating class quartile rank and the size of their graduating classes were reduced by post-stratification of the population.

Findings.-- Grouping of the graduates according to agricultural classification of their occupations indicated that 29.63 percent were farmers and farm managers, 13.31 percent were engaged in off-farm agricultural occupations, 1.93 percent were farm laborers, and 55.13 percent were engaged in non-agricultural occupations.

Chi-square analyses revealed highly significant relationships between the agricultural classification of the graduate's occupation and: extent of migration; Iowa economic area of the high school; size of home farm; father's farming status; number of siblings; semesters of vocational agriculture; quartile rank in high school graduating class; year of graduation; post-high school education; and type of post-high school educational institution attended.

A higher percentage of graduates from high level of living index areas were farmers and farm managers, whereas more of the graduates from low index areas entered non-agricultural occupations.

Highly significant relationships existed berween the census classification of the graduate's occupation and: education of father and mother; semesters of science; and semesters of mathematics.

Occupational income, high school activity participation, and quartile rank tended to be positively correlated with the migration of the graduates. Likewise, Iowa economic area, level of living index of home, number of siblings with a college degree, semesters of science, semesters of mathematics, and semesters of vocational agriculture were related to the migration patterns of the graduates.

From analysis of variables pertaining to all graduates, positive correlations were derived between the occupational prestige scale value and: quartile rank (.335); semesters of mathematics (.228); occupational income (2.85;) and enrollment in a post-high school educational institution (.364). Income received by the graduates was positively correlated with: quartile rank (.128); extracurricular activity participation (.154); post-high school education (.125); and negatively correlated with recency of graduation (-.113).

X INTERNATIONAL AGRICULTURAL EDUCATION

HU, CHI-HO A Survey and Improvement of the Method of Food Processing Chosen by Rural Families by Using the V-A School's Processing Factories as the Canning Centers. Non-Thesis Study, 1963, 21 p. Department of Agricultural Education, Taichung, Taiwan (English copies located in Library, Michigan State University, East Lansing, Michigan and Library United States Department of Agriculture, Washington, D.C.)

Purpose.-- To determine (1) the present conditions for food processing in the V-A schools as to scope, facilities and equipment, (2) the kind of products and methods of processing used by rural families and (3) the ways of raising the economic value and lengthening the storage time of processed farm products by rural families.

Method.-- Data were collected from ten Provincial V-A schools and six County V-A schools which had received U.S. aid during the past several years, and from ten percent of the rural families who were known to do food processing and lived within four kilometers of the V-A schools. Four interviewere collected the data during the summer of 1962.

Findings.-- More than 90 percent of the food processing centers were constructed or renewed by U.S. aid. The water systems, power systems, and drainage systems were found to be inadequate. Some of the food processing centers were considered too small to be used as community canning centers. The 116 rural families reported they processed 55 kinds of food. The ten most frequently processed raw materials were pickling melons, radishes, soybeans, mustard leaves, bamboo sprouts, rice, cabbages, ginger and wax gourds. The most frequently reported problems in processing were temperature control for fermentation in the making of soybean sauce and showers (rains) on fruits and vegetables sun dried. About 70 percent of the families reported they learned the methods of food processing from their families, and about 20 percent said they learned the processes through training classes conducted by the Farmer Associations. Less than two percent said they learned the processes from V-A schools.

Most (over 80 percent) of the families said they processed food only for consumption by their own families. Nearly 20 percent said they would like to learn additional skills and techniques for food processing. The Farmer Associations were named by 56 percent of the families as their choice of source for learning the new skills and techniques, while 30 percent named the V-A schools as their choice. The three most frequently named processes desired to be learned were preparation of pickles, vegetable processing, and dehydration techniques.

Analysis of samples of food processed by rural families revealed a retention of only 30 percent of the ascorbic acid when compared to the content in fresh raw materials.

JUGSURAT, BOONLERT Developing a Course of Study for Farmers in the Ayuthia Agricultural School Vicinity. Colloquium Paper, M.A., 1963. Agricultural Education Department, University of Minnesota, St. Paul, Minnesota.

Purpose.-- To identify the needs of the farmers living in the vicinity of the school and to design an appropriate course of study in agriculture for these farmers.

Method.-- The writer sent a form of questionnaire, in Thai language, to a teacher at the school in Ayuthia, Thailand, to collect information by interviewing the farmers at their respective homes in Tumbol (district) Park-karn and to return the same. There are about 300 farm families in this Tumbol (district). One hundred and two questionnaires have been received from Thailand.

Findings and Interpretations.-- Most of the farmers in the Tumbol fall between 41 and 50 years of age. Most sizes of the farms fall between 26 and 60 rai (2½ rai equal 1 acre). Ninety seven out of 102 farmers own their farms. Rice is a major farm business in this area. The yields of rice in this area mostly fall between 25 and 28 tung per rai (one tung equals ½ bushel) which are relatively low. Only 22 cases have been raising livestock and 12 of them are laying duck and 6 of them are laying hens. However, many farmers also want to raise duck and hen. Their major problems are market, deterioration of soil and water. These problems may be solved by cooperative practices but the farmers do not realize this fact. Courses which are desired to take by more than 50% of the farmers are: soil conservation, machinery implementation, plant propagation, pest and disease control, poultry raising, and swine raising. So these courses are included in the course of study. Since the major problems of the farmers may be solved by cooperative practices, the principle of cooperatives and cooperative activities are also included in the course of study. Record keeping is necessary to the program so the farmers are required to do the record keeping as well.

LEE, TEH-KUEI The Demand and Supply of Farm Labor of the Families of Taiwan Vocational Agriculture Students. Original in Chinese with English summary. (Single copies deposited in Library, Michigan State University and Library, U.S. Department of Agriculture, Washington, D.C.)

Purpose.-- To determine the demand for all the supply of labor and the extent of underemployment on the farms from which the vocational agriculture students come.

Method.-- Mail questionnaires were sent to three farm-students in each of the 655 classes of students in the 41 vocational agriculture schools in Taiwan. A new method of economic analysis was used to estimate the extent of underemployment. The factors used for adjusting labor supply were family size, and coefficient of correlation between man equivalent and family size. The factors used for adjusting labor demand were farm size (cultivated land), labor demands between farms and their correlation coefficients. The extent of unwilling unemployment was determined by marginal change analysis with theoretical judgment.

Findings.--The supply of labor was found to average 2.87 man equivalents per vocational agriculture student farm per year, or 947 man working days available per farm per year. The labor willing to be supplied was found to average 727 man working days per farm per year. The demand for labor averaged 594 man working days per farm per year, or 58 percent of the labor willing to be supplied. Therefore, the unwilling unemployment to the extent of 178 man working days for the average vocational agriculture student farm per year. Projected estimates of the underemployment of persons living on all farms in Taiwan was 186 man working days, or 24 percent for 1961 and 31 percent for 1971.

LOCKWOOD, LARRY LEE Competencies Needed by Males Engaged in Dairy Farming. Thesis, M.S., 1964, Iowa State University of Science and Technology. 97 p. Library, Iowa State University of Science and Technology. Ames, Iowa.

Purpose.-- (1) To determine the competencies needed by men engaged and successful in dairy farming, (2) to determine the relation of selected factors to the evaluation of the degree of competence needed and possessed by a selected sample of DHIA and owner sampler dairymen in Iowa, and (3) to plan for educational needs of future replacement dairy farmers.

Method.-- A panel of 16 selected dairymen and Iowa State University of Science and Technology staff members identified the competencies needed by males engaged in dairy farming. A questionnaire was developed around this list and submitted to a random sample of 130 DHIA and 130 owner sampler dairymen in Iowa, with instructions to evaluate (1) the degree of competence they needed to succeed, and (2) the degree of competence they presently possessed. Responses (70 percent) indicating degree of competence needed and possessed were analyzed using mean scores.

Findings.-- Of the 46 competencies listed by the panel, 11 were understandings and 35 were abilities. Highest overall scores for degree of competence needed by both groups were found for the understandings of: dairy product standards set by law and by the local milk market; methods of maintaining high sanitation standards and the use of chemicals in this operation; and for the abilities to: feed cows a balanced ration based on maintenance and production needs; make efficient use of high quality roughage; select desirable production and breeding stock; and follow a constructive breeding program. Respondents felt they possessed significantly less competency than they needed in all of the 46 competencies.

Comparisons among groups showed the following relations between total overall scores for competence needed and possessed: (1) younger dairymen had wider differences than older dairymen; (2) dairymen with fewer years of experience had wider differences than those with more experience; (3) DHIA dairymen had wider differences for men with less formal education, whereas owner sampler dairymen had wider differences for those with more formal education; (4) increased years of vocational agriculture tended to widen the difference.

Relationships between selected control variables and degree competence needed and possessed scores in 10 selected competencies were studied using correlation analysis. Highest correlation coefficients were found between the ability needed to make efficient use of high quality roughage and (1) the ability needed to feed cows a balanced ration based on maintenance and production needs (.75) and (2) the ability needed to determine amount and kind of concentrate to feed, considering dairy product prices and input costs (.58).

MAI, TCHONG-CHIN A Study of Farm Mechanization and Farm Mechanics Skills of Farmers in Central Taiwan. Non-Thesis Study. Published by Provincial Chung-Hsing University, Taichung, Taiwan, 1963, 35 p. Printed in Chinese with an English summary. Also deposited in the library, Michigan State University, East Lansing, Michigan, and Library, United States Department of Agriculture, Washington, D.C.

Purposes.-- To study the kind and amount of farmpower, tools, and equipment on farms; the kind of equipment desired, the farm mechanic skills performed at home and hired, and the kind of skills needed in relation to farm size, farming status, level of education and financial condition of the farmer.

Method.-- A check list of 38 farm tools, and implements, and 61 farm mechanics skills was prepared as an interview-questionnaire. A two-stage systematic sampling procedure was used to select 536 sample farmers from a total of 85,360 in the rice regions of Changhwa and Nantou counties. Sixty-seven sample villages were selected in the first-stage sampling with probability proportionate to size (numbers of farmers per village). Eight farmers per village were selected by sampling according to the size of farms (only farmers with 0.2 chia or more of cultivated land were included. One chia = 0.95 hectare; 0.2 chia = approximately 0.5 acre). A reserve sample of two farmers per sample village was selected for use when the interviewers were unable to complete a regular interview due to "not at home". The responses were analyzed by controlling farm size, farming status, level of education, and financial condition of the farmer.

Findings.-- Almost one-half of the farmers interviewed could neither read nor write. Forty percent of the farmers interviewed were over fifty years old. More than three-fourths of the farmers had less than one chia of land, and 42.54 percent had only 0.2 to 0.5 chia. More than one-half of the farmers reported less total income than expenditures during the past year, about seven percent reported some profit, and others said their income and expenditures were balanced.

Mechanization. Eighty-six percent of the farms were supplied with electricity. The main source of power for farming was the water buffalo. However, alsmost two-thirds of the farmers did not own a water buffalo, two percent owned two, and none owned more than two. Very simple tools such as hoes, rice sickles, grain scrapers, etc. were owned by all or most farmers. About 1.9 percent of the farmers owned and used power tillers instead of water buffaloes.

Farm mechanic skills. The farmers hired someone to perform fewer of the skills than they performed by themselves. More were interested in improving their skills for use of power equipment than for the other equipment. Both the size of farm and number of farmers with sufficient total income were positively correlated to the farmers' opinions of their skillfulness in performing the listed mechanical activities. No significant relationship was found between the level of schooling and the reported skillfulness of the farmers for the listed skills. No significant relationship was found between farm status and the farmers' opinions of their skillfulness in the listed skills, either those hired or those performed by themselves.

Instruction in farm mechanics. The study also revealed that most of the farmers desired to have their children learn those farm mechanics skills related to power equipment. They expressed a desire to have those skills taught in V-A schools or to have their children serve as apprentices to learn the skills. About 40 percent of the farmers indicated it was important for their children to learn the farm mechanics skills other than for power equipment. However, more than fifty percent expected their children to learn these skills on the home farm. About eleven percent of the farmers reported participation in one or more agricultural classes for farmers during the past year sponsored by the Farmers Association, V-A Schools and other organizations.

MEADERS, O. DONALD, LIN, L. C. and OTHERS Follow-up Study of Taiwan Vocational Agriculture School Graduates: Their Jobs, Their Educational Background and Other Information With Implications For V-A Schools. Staff Study, 1963, 179 p. Department of Agricultural Education, College of Agriculture, Taiwan Provincial Chung Hsing University, Taichung, Taiwan and Michigan State University Advisory Group. Original in Chinese. (Single copies deposited in Library, Michigan State University, East Lansing, Michigan and Library, U.S. Department of Agriculture, Washington, D.C.)

Purpose.-- Three purposes for this study were (1) to determine the present occupations of the graduates from the vocational agriculture schools, (2) to secure opinions of the graduates regarding the adequacy of their training in the vocational agriculture schools for their present occupations and (3) to determine the role of the schools in relation to changing practices in agriculture as viewed by the graduates.

Method.-- A randomized sampling design was used to select graduates from the junior and senior vocational agriculture school programs for the years, 1950, 1955 and 1959. Randomly selected subsample of the respondents to a mail questionnaire was selected for personal interviews. The population consisted of more than 13,000 graduates; the mail questionnaires were sent to approximately 4,800 graduates and 853 graduates were selected for interviews. Data from both mail questionnaires and interview questionnaires were coded and punched on IBM cards for tabulations and analysis. Responses were secured from 95.1 percent of the graduates in the sample who received mail questionnaires and 766 interviews were completed, representing 89.8 percent of those in the sample for interviews.

Findings.-- The graduates from the vocational agriculture schools were found to be mainly boys, most of whom were born in Taiwan, and lived in rural areas when they first enrolled in the vocational agriculture schools. The parents of about two-thirds of the graduates were employed in farming at the time the graduates enrolled in the vocational agriculture schools. About four percent of the graduates reported they had attended colleges and universities. Non-agricultural subject areas were more frequently chosen than agricultural areas for study at the colleges and universities.

A relatively small percent indicated they chose their occupation or career either before entering the vocational agriculture school or during their enrollment in the schools. About one-half of the graduates reported that their vocational agriculture school training helped them to get their first job.

Most of the graduates were found to be employed and within the geographical service area of the school from which they had graduated. Nearly forty percent were employed in occupations classified as agricultural, including about 30 percent in farming. Many of the graduates engaged in farming also were employed part-time in other occupations.

Nearly 80 percent of the senior vocational agriculture school graduates had followed the curriculum of agronomy, comprehensive agriculture, or animal husbandry and veterinary medicine. "Chinese" was listed by more than 30 percent as the most helpful course in their present job, and the courses classified as "Crops" were second most frequently listed. Graduates in agricultural occupations listed agricultural courses as "most helpful" much more frequently than did those graduates employed in non-agricultural occupations.

Most of the graduates engaged in agricultural occupations recommended general training in all divisions of the vocational agriculture school rather than specialization in one division. The graduates were generally agreed that the schools should offer instruction to adults in cooperation with the Farmer Associations. The vocational agriculture schools were viewed by the graduates as positive forces for changing agricultural practices.

PAI, CH'IEN. Descriptions of Agricultural Jobs Most Frequently Held by Vocational Agriculture School Graduates. Non-Thesis Study, 1963, 64 p. Departmentof Agricultural Education, College of Agriculture, Taiwan Provincial Chung Hsing University, Taichung, Taiwan. Original in Chinese with an English summary. (Single copies deposited in Library, Michigan State University, East Lansing, Michigan and Library, U.S. Department of Agriculture, Washington, D.C.

Purposes.-- To determine the jobs most frequently held by Vocational Agriculture School Graduates; to prepare descriptions of those jobs; and to make information available as a reference for improving the curricula in the Vocational Agriculture Schools.

Methods.-- A two-stage random sample of the graduates from junior and senior vocational agriculture schools for the years 1950, 1955, and 1959 were interviewed in the summer of 1962. The interviewers were senior students from the Department of Agricultural Education who could speak both Mandarin and Taiwanese. The 902 completed interviews were conducted at homes, places of work, and vocational agriculture schools.

Findings.--The jobs held by the graduates were classifed in 47 titles including 20 agricultural jobs and 27 non-agricultural jobs. Descriptions were prepared fpr all 47 titles using a general outline consisting of: proportion of graduates engaged in the job, nature of work performed, place of work and working conditions, supervising responsibilities, educational requirements for entry, basis for promotion, and salary and other benefits.

About 60 percent of the interviewees were in agricultural occupations in which training in agriculture through the vocational agriculture schools was considered essential for initial employment. About 24 percent of the interviewees were farmers and an additional 15 percent directly participated in agricultural production.

PAI, CH'IEN. Practices Used by Agricultural Extension Organizations and Vocational Agriculture Schools to Conduct Farmer Training Programs in Taiwan. Non-Thesis study, 1963, 66 pp. Published in Taiwan Provincial Chung Hsing University, Taichung, Taiwan. Original in Chinese with an English summary. (Single copies deposited in Library, Michigan State University, East Lansing, Michigan and Library, U.S. Department of Agriculture, Washington, D.C.)

Purpose.-- To determine and evaluate the practices which have been used by vocational agriculture schools and the extension division of the farmer associations to conduct farmer training programs.

Method.-- Regional workshops were conducted to secure information from vocational agriculture teachers and representatives from the farmers associations about the practices used to conduct farmer training classes. Data were subsequently collected from 34 vocational agriculture schools and 15 county farmer associations as well as from 97 percent (355) of the vocational agriculture teachers and 80 percent (60) of the county farmer association staff members who had taught and/or organized farmer training classes.

Findings.-- Thirty-four of the 41 vocational agriculture schools had conducted 612 farmer training classes during the ten-year period 1953-63. Most of the enrollees were men (84%), the average length of the class was 11 days, and the average enrollment was 62 men and women per class. The average age of the participants was 26 and the average educational level completed was sixth grade. Most of the classes were conducted during the months April, May, June and December.

The farmers associations and the vocational agriculture schools were found to have cooperated closely for planning, organizing, and conducting many of the classes. There were ten subject areas covered by the classes offered.

Thirty-one of ninety-five practices for planning, financing, administering, conducting, and evaluating the farmer training classes were agreed upon by both the vocational agriculture teachers and the staff members of the farmer associations as being valuable.

WYETH, IRVING RUDOLPH Status-Role Perceptions in the Taiwan Extension Organization. Dissertation, Ph.D., 1964. Michigan State University. 167 p. Library, Michigan State University, East Lansing, Michigan.

Purpose.-- (1) to determine the attitudes held by status-role groups with respect to how they view the actual structure and functionality of their present organization and their perceptions of expectations and needs for organizational change, and, (2) to ascertain whether or not there was consensus between these status-role groups relative to such attitudes and perceptions.

Method.-- Role theory was used as the study's theoretical frame of reference. It was hypothesized that status-role groups of the Taiwan extension organization (1) would not hold significantly different attitudes toward the structure and functionality of the present organization, (2) would not significantly differ in their perceptions of expectations and needs for organizational change, and (3) there is no relationship between the consensus on attitudes held toward the present organization and the consensus on perceptions of expectations and needs for organizational change. An attitude scaling schedule composed of 30 statements dealing with organizational and administrative principles applied to the present organization was developed and administered.

The data for this cross-cultural investigational change were collected from four status-role groups, namely, 8 administrators, 14 supervisors, 91 advisors, and 10 specialists. Of these 46 were interviewed to determine their perceptions of what was expected and believed for organizational change, oriented to each of the four status-role groups and self. Other data were collected by non-directed interview, observation, and document schedules.

Findings.-- There was a relatively high degree of inter-group consensus regarding the structure and functionality of the present organization. Such consensus tended to be one of general disagreement to 30 statements which described an effective and efficient organization. There was no significant difference in the consensus between administrators, supervisors, advisors, and specialist groups with respect to 15 of 18 ranked expectations and 12 of 17 ranked needs for organizational change revealed in mixed patterns depending upon particular aspects of organizational and administration in question.

Findings of the study identify areas of inter-group consensus and suggest the types of stresses and strains confronting the organization. The implications of the study for the Taiwan Extension Chief and his immediate staff of administrators are: improved authority-responsibility relationships; organizational goal achievement; the need for professional improvement programs; improved cooperation and coordination; the carrying out of assigned responsibilities; consideration for the selection of more competent personnel; better planning and decision-making; more adequate financial support for extension; and job security.

XI MANAGEMENT INSTRUCTION

HOENHAUS, WILLIAM EDWARD An evaluation of the Vocational Agriculture Farm Management Program of Southern Minnesota. Colloquium Paper, M.A. Department of Agricultural Education, University of Minnesota, St. Paul, Minnesota. 1964.

Purpose.-- To determine the impact of the existing Vocational Agriculture Farm Management Program on the co-operating farm families of Southern Minnesota and pinpoint some of the changes they would like to have made in the program.

Method.-- A survey was taken of 140 Vo-Ag Farm Management Co-operators from six Southern Minnesota school systems. The survey questions were oriented toward what type of farm family participates in the management program, how they make use of summary information and what changes should be made in the program. Ninety-one survey forms were summarized for the study.

Findings and Interpretations.-- The average Vo-Ag Farm Management co-operator was 38 years old and had been farming 12 years. Forty-three percent had participated in the program for four years or more. The majority or 71% had been contacted personally by the instructor for participation in the management program. The co-operators used their farm business summary information as an indicator of their business progress and for making major management decisions. Seventy-one percent of the farm families found on-the-farm instruction very valuable to them. Classroom instruction was considered very valuable to 42% of the co-operators. The majority of the farm families stressed a desire for more help in planning and making adjustments to their farm business, based on summary information. Forty-nine of the families showing their net worth at the start of the program and what it was when they filled out the survey, had an average increase in net worth of $2425.90 per year. Findings were of such significance as to warrant recommendations for improvement in the Vo-Ag Farm Management Program in Southern Minnesota. The instructional program in farm management should be expanded to include more beginning and older established farm families. Instructional techniques should be improved by better preparation for group instruction in the classroom. Also, farm visits should be scheduled with established goals, so more assistance may be given the farm family in making adjustments in their farm business.

McCORMICK, FLOYD G. The Development of an Instrument for Measuring the Understanding of Profit-maximizing Principles. Dissertation, Ph.D., 1964, The Ohio State University. 225 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to develop an instrument for measuring the understanding of basic profit-maximizing principles essential for efficient operation and management of a farm business, with implications for vocational education in agriculture.

Method.-- Basic profit-maximizing principles were identified from farm management references nominated by the farm management staff at The Ohio State University. The results of three pretests were utilized in refining the forty-five multiple-choice questions contained in the final evaluative instrument.

Year-end business analysis data from 158 farm ownership borrowers of the Farmers Home Administration in Ohio were used to determine discriminate groups of farm managers. Input-output, cost of production, and growth of business indexes were computed for each farm operator. Final identification of a farm operator's relative level of managerial competence was based on the aggregate rank order synthesized from individual index ranks.

Statistically, the Mann-Whitney U test was used to identify multiple-choice questions discriminating between level of managerial competence and understanding of profit-maximizing principles. The F test was used to test the significant difference between selected economic factors and personal characteristics of the population and relative levels of managerial ability.

Findings.-- Seven basic profit-maximizing principles contributing to efficient farm organization and planning were identified as: Diminishing physical returns; diminishing economic returns; fixed-variable costs; substitution; equi-marginal returns; combinations of enterprises; and time relationship.

Nineteen of the forty-five multiple-choice questions possessed positive, significant relationships between levels of managerial competence and understanding of economic principles. The evaluative instrument developed in this study provided increased insight for measuring the understanding of six profit-maximizing principles.

The analysis of variance revealed no significant difference between achievement on the evaluative instrument and level of managerial competence. Only 59.9 percent of the questions were answered correctly by the farm managers used in this study, which indicates that a large percentage of the farmers did not possess a comprehensive understanding of profit-maximizing principles as measured by the evaluative instrument. Older farm operators possessed less understanding of basic principles than did younger farm managers.

There was a direct correlation between the understanding of principles and the years of formal schooling completed. However, there was no significant relationship between relative level of understanding of profit-maximizing principles and the application of these principles in the farm business.

Size of operation, gross farm income, net farm income, and increase in net worth were four of the ten selected economic and personal factors which differed significantly between relative levels of managerial ability. Net farm income and gross farm income were the most significant indicators of an individual farm manager's economic efficiency. The "cost of production" ratio was the most discrete economic index for predicting the relative level of managerial competence.

WARREN, JAMES WILEY, Jr. A Basis for a Farm Management Instruction Program for Full-time Farmers in the Eastern Supervisory District of North Carolina. Thesis, M.Sc., 1964, The Ohio State University. 105 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The major purpose of this study was to develop a basis for improving farm management instruction in Negro Post High School Vocational Agricultural classes in the Eastern Supervisory District of North Carolina.

The following specific objectives were defined to accomplish the purpose of this study: To determine the farm management abilities which full time Negro farmers believe important for success in farming and to identify those in which organized instruction was desired; to consider the relationship of selected characteristics of full-time Negro farmers and vocational agriculture teachers to their perceptions of the farm management abilities they considered important; and to determine the additional organized in-service education which the teachers believed they need to teach farm management abilities to farmers.

Method.-- The study included 971 full-time farmers and 92 teachers in 42 Eastern counties comprising the Eastern Supervisory District of Vocational Agriculture Education in North Carolina. Data were secured by interviews and questionnaires covering the respondents' perception of the importance of selected farm management abilities for success in farming and the desire of teachers and farmers for instruction.

Findings.-- Farmers and teachers similarly perceived 89 percent of the farm management areas and abilities as being of "much" importance to success in farming in their area.

Farm management abilities in the crops and records areas were judged most important to success in farming by both farmers and teachers. Farmers evidenced the most desire for instruction in the area of labor, machinery, and buildings management abilities.

Teachers desired in-service education most in the areas of farm mechanics and farm management.

The relationships between the recognition of importance of the selected farm management abilities and the need for instruction according to personal characteristics and status of farmers were with few exceptions statistically insignificant.

XII MISCELLANEOUS STUDIES

CVANCARA, JOSEPH GEORGE Input-Output Relationships Among Selected Intellectual Investments in Agriculture. Thesis. Ph.D., 1964, University of Minnesota. 113 p. Library, University of Minnesota, St. Paul.

Purpose.-- (1) To determine the direction and degree to which production units in agriculture respond to educational investment and to identify whether instruction in farm management influences various farm measures (returns) and thereby affects farm income; (2) to study the cumulative or diminishing effects on increases in cash income which may be caused by farm management instruction when matched farm units are compared after one, two or three years.

Method.-- Data were collected on two groups of Minnesota farm units representing 20 communities. Group "A" farm units participated in the Minnesota farm management program during the years 1960, 1961, and 1962. Group "B" farm units did not receive management instruction in 1960 and 1961, but did receive this instruction in 1962. Group "A" and "B" farm units were paired on the basis of the 1962 records according to size, measured in work units and on the combination of livestock and crop enterprises. Farm units were selected within areas where soil, climate and topographical factors were similar in nature.

Cash income was the criterion variable used to evaluate the effect of several different predictive variables. The tests of significance included the t test, the F ratio as developed through variance analysis and also through multiple correlation and regression techniques.

Microeconomic investigations were made on the input costs of farm management instruction on each of the 66 farm units. Further analyses were made to measure whether the increases in farm output for those farmers enrolled in management exceeded the community input costs for conducting a farm management program.

Findings and Interpretations.-- There was significant evidence that the farmers in Group "A" receiving instruction had over $500.00 higher average farm incomes than farmers in Group "B". The study further showed that (1) Group "B" farms had the potential of increasing farm income; (2) that improvement in farm income is subject to the diminishing return effect; and (3) that there was an increase in income from year to year with the greatest increase occurring during the second year of this experimental three year period with a higher average rate of increase for those farmers participating in a farm management program.

There should be other research on similar groups using similar or different predictive variables and criteria. Follow-up studies should be made to determine the conditions affecting the relationship between educational inputs and financial returns. This study was made over a three year period. Further studies should be made over longer durations of time.

HEIMLICH, RICHARD E. The Non-Vocational Programs in Agriculture in the Public Schools in Ohio. Thesis, M.Sc., 1964, The Ohio State University. 70 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to identify the number and nature of the non-vocational agriculture courses being offered in the public schools of Ohio, and further, to determine the administrator attitudes toward agricultural courses.

Method.-- A questionnaire was developed and went to all schools in Ohio listing a non-vocational agriculture program in the 1963-64 school year. A second questionnaire was developed and sent to administrators of one-fifth (150 schools) of the public high schools not offering a program in agriculture.

Findings.-- Of the 1083 public high schools in Ohio, only 21 offered programs in non-vocational agriculture. These programs were: five conservation, offered in urban areas of the state; four horticulture, all in the Cleveland area; and twelve general agriculture programs, offered in urban areas and rural areas not served by Vocational Agriculture.

The number of students enrolled in the courses ranged from four to 93. Conservation courses enrolled an average of 54.2 students, horticulture 30, and general agriculture 27.6. The courses were offered from one to four years with the most frequent offering being the eleventh and twelfth year. Only one pre-high school agriculture course was offered at the eighth grade level.

Non-vocational agriculture was most often offered two semesters with five periods of instruction per week with the most usual period being 45 minutes. The courses were offered as an elective and to both boys and girls in 16 of the 21 schools.

The primary purposes of these programs were to develop some understandings and an appreciation of conservation, horticulture, and general agriculture. Textbooks and bulletins were generally used but there was no preferred textbook. Projects were not generally required of the students; laboratories and field trips were used in most programs. Extended service was not used to conduct the non-vocational agricultural programs; neither was extended service preferred by the teachers.

Few school administrators are planning the addition of an agricultural program to the school curriculum. Most school administrators appeared to be not well informed concerning the possibilities of an agricultural program. They consider an agricultural course to be of value only to students intending to farm.

LEIMBACH, GALE J. A Study of Vocational Agriculture For Students From Urban Homes. Thesis, M.A., 1964, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of the study was to investigate the effects of the urban population upon the vocational agriculture enrollment, to determine the trends of urban enrollment in vocational agriculture, some of the characteristics of those students and some of the educational values from vocational agriculture that former students from urban homes were finding helpful in their present occupations.

Method.-- Questionnaires were mailed to 170 teachers of agriculture in Ohio who had taught in the same school system from 1958 to 1963. A total of 105 questionnaires or 61.7 percent were returned. These teachers supplied names and addresses of students who came from urban homes and had left their departments during the school years 1958-59 and 1959-60. One hundred questionnaires were mailed to these students. A total of 51 were returned.

Findings.-- 1. Students from urban homes made up one in four of the total vocational agriculture enrollment among the selected departments in Ohio during 1963-64 and during each of the preceding years.

2. The number of students enrolled in high school and vocational agriculture increased approximately 20 percent during the period from 1961 to 1964 with an increase each year.

3. One in four of all the students of vocational agriculture from 1961 to 1964 discontinued the course. Of these, 43.7 percent were urban students compared to 62.3 percent for farm students.

4. The reasons given for boys discontinuing vocational agriculture showed quitting school, changed curriculum or moved, as the three most important reasons.

5. Forty six percent of the former urban students were engaged in farming, attending agriculture college or employed in an occupation related to agriculture in 1964 whereas only 40 percent reported the same occupation immediately after graduation.

6. Vocational agriculture assisted these students in their present occupations most in terms of handling the skills of their jobs, in providing leadership experience, in learning of job opportunities in agriculture and in making managerial decisions.

7. Approximately three-fourths of the teachers reported they had made changes in the curriculum for farm mechanics and crop production including horticulture because of urban students. Three-fourths also indicated more changes would be made in farm mechanics.

SIMEK, MELVIN T. A Study of the Image of Vocational Education in South Dakota Public Schools. Research Problem, M.Ed., 1965, South Dakota State University. Library, South Dakota State University, Brookings, South Dakota.

Purpose.-- This study was designed to discover the revisions and additions that are needed in the vocational curriculums of South Dakota public schools, so that youth may be better prepared for employment.

Method.-- Information was secured from South Dakota school adminsitrators who had one or more vocational departments, from vocational agriculture teachers and vocational homemaking teachers. Information compiled in this research problem was gathered through mailed data gathering instruments.

Findings.-- The findings based on the analysis of the data related to three concise considerations: (1) curriculum development and administration, (2) socio-economic and academic aspects and (3) teacher-administrator relationships. This investigation indicated that both vocational homemaking and vocational agriculture teachers should endeavor to project the importance of their programs. There is a considerable awareness of the quality, value and worth of the vocational education programs.

Results of the investigation showed that qualified teachers and finances could be better utilized if vocational education programs served geographic areas larger than the regular school district. This research revealed that local school districts could not finance and expand vocational education programs without federal aid and state aid. The study points out that the colleges are adequately providing professionally trained vocational teachers, but there is a need for more in-service professional training.

There is some evidence from the study that students enrolled in vocational education are subjected to more social disadvantages than those in non-vocational education. It was further recognized that boys in town who are interested in working in farm related agricultural fields should have an opportunity to enroll in vocational agriculture classes.

ZIMMERLY, GLENN EVERETT. Selected Training Needs of Students Preparing For Agricultural Missionary Roles. Thesis, M.A., 1964, The Ohio State University. 132 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The chief purpose of this study is: (1) To determine which courses agricultural missionaries would recommend to prospective personnel preparing for similar work; (2) To determine in which specific areas of responsibility these recommended courses are being used and how they are being used; (3) To determine the preparation, training and background agricultural missionaries presently have to distinguish between professional and general agricultural missionaries.

Method.-- Two hundred twenty questionnaires were sent to agricultural missionaries active in foreign agricultural service who are representatives of Protestant Mission Boards. These missionaries are at work in 56 different countries. The majority of the names on the mailing list were suggested by Agricultural Missions, Inc., 475 Riverside Drive, New York 27, N.Y. The names of individual missionaries were selected by choosing every other name listed under each country where agricultural missionaries are presently at work.

Information sought by the questionnaire included college, seminary, and post graduate training; occupational background; a rating of all undergraduate agricultural courses as to their degree of helpfulness; activities presently engaged in by agricultural missionaries and the training needed for these activities.

Findings.-- Some of the more significant findings of the study are as follows: (1) Of the 99 missionaries replying, 26 percent did not consider themselves to be agricultural missionaries. (2) Only 49 percent had received training in the field of agriculture. (3) Forty-five percent of the professional agricultural missionaries had an M.S. degree, while 50 percent of the missionaries had received seminary or Bible training. (4) The three most important activities of professional agricultural missionaries are: "Improving local plants, seeds, animals, and tools," "Introducing new varieties of plants, seeds, animals, and tools," and "Conducting agricultural schools." (5) The top ten courses as rated by professional agricultural missionaries are: Extension Methods, Poultry Feeds and Feeding, Feeds and Feeding, Rural Sociology, General Horticulture, Poultry Production, Soils, Forage Crops, Field Crop Production, and Livestock Production. (9) "Write-in" courses rated highly by missionaries were entomology, anthropology, plant pathology, agricultural finance, farm buildings, tropical and sub-tropical fruits and audio-visual aids.

XIII TEACHER EDUCATION IN AGRICULTURE

BENTLEY, RALPH R. and REMPEL, AVERNO M. The Measurement of Teacher Morale: A Factor Analysis Approach. 1965 Purdue University, Lafayette, Indiana.

Purpose.-- To factor analyze the 145-item Purdue Teacher Morale Inventory in order to obtain new insights regarding the categorization of the items which had been arbitrarily grouped into eight categories pertaining to the teacher and his school environment. The eight categories are: (1) teaching as an occupation; (2) relationships with students; (3) relationships with other teachers; (4) administrative policies and procedures; (5) relationships with the community; (6) curriculum factors; (7) working conditions, and economic factors.

Method.-- The factor analysis of the Purdue Inventory was based on the responses of approximately 500 secondary school teachers which included a number of vocational agriculture and other vocational teachers. The procedure used in this study was a principal component analysis of the image - covariance matrix followed by an oblique (Carroll biquartimin) rotation of the extracted factors. The necessary computations and rationale for this particular solution of the factor analysis have been summarized in recent papers.* The computor programs were developed for the IBM 7090 computor by John B. Carroll, Harvard University.

Findings.-- The factor analysis gave quantitative evidence that teacher morale is not unidimensional. In the Purdue Teacher Morale Inventory eight distinct factors were identified which were in substantial agreement with the eight categories that had been set up in an arbitrary manner. The new categories have been labeled as follows: (1) Teacher rapport with the principal, (2) Personal satisfaction with teaching, (3) Teacher rapport with other teachers, (4) Teacher salary, (5) Teacher load, (6) Teacher relationship with community, (7) School facilities, and (8) Teacher status.

The factor analysis suggests several possibilities for refining and revising the Purdue Inventory. First of all, a number of items can be deleted without diminishing the evaluative and diagnostic uses of the instrument. The analysis also suggests the re-wording and re-working of the specific items particularly when items loaded heavily on more than one factor. Then, it will be necessary in one or two of the categories to construct and add new items in order to get more adequate coverage of the factors involved.

The instrument can be used as a basis for cooperative effort to improve existing conditions which affect morale and to develop in-service procedures that will up-grade the environment in which students, teachers and administrators work.

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* John B. Carroll. "Biquartimin Criterion for Rotation to Oblique Simple Structure in Factor Analysis." Science CXXVI (1957) 1114-1115.

NAUMAN, WILLARD CLARENCE. A Survey of Professional Problems Encountered by Teachers of Vocational Agriculture in Minnesota According to Length of Teaching Experience. Colloquium, M.A., 1964, University of Minnesota, Library, University of Minnesota, St. Paul, Minnesota.

Purpose.-- To identify specific problems encountered by vocational agriculture teachers in Minnesota, and to compare the persistency and severity of each problem with length of teaching experience.

Method.-- Two questionnaires were sent to all teachers of vocational agriculture in Minnesota who had one, two, three, four, ten, and eleven years of teaching experience. The first questionnaire served to accumulate an inventory of professional problems. The second questionnaire, based completely on the responses submitted by the cooperating instructors in the first questionnaire, consisted of a list of specific problems and requested that each problem be ranked for its severity in the local situation. The acquired data was then organized so that a comparison could be made of the kind and severity of problems and length of teaching experience.

Findings and Interpretations.-- The most serious problems revealed by this study were inadequate time, education of adults and young farmers, maintenance of satisfactory supervised farming programs, motivation of students, and competition from other courses and activities.

The problem of inadequate time was equally severe for those in single and multiple-man departments and for those with one to four, and ten and eleven years of teaching experience. The study yielded evidence that this problem could be ameliorated by adequate secretarial help, availability of a prepared course of study, elimination of low-quality FFA activities, and the removal of non-ag school responsibilities.

Many teachers felt that an increase of multiple-man departments and usable lesson plans would strengthen the problem areas of adult farmers, young farmers, and farm management.

The major problems in supervised farming programs were project growth and the maintenance of accurate and complete records.

Common problems dealing with student motivation included the selection of appropriate teaching methods and materials, low ability students, negative attitude toward the future of farming, poor interest in farm management, and inadequate school guidance.

Competition for the students' time and interest was vigorous in both the high school and out-of-high school programs.

In addition, the study supported the following positive conclusions: (1) Preservice training for instructors was very satisfactory; (2) Vo-Ag instructors maintain good relationships with other school personnel; (3) Excluding supervised farming programs, FFA was not a major problem area.

XIV TECHNICIAN TRAINING AND AGRICULTURALLY RELATED OCCUPATIONS

BAILEY, JOSEPH KENNA Non-Farm Agricultural Employment in West Virginia, with Implications for Vocational Education Programs. Dissertation, Ph.D., 1964, Ohio State University. 202 p. Library, College of Agriculture, Ohio State University, Columbus.

Purpose.-- To appraise the non-farm agricultural employment in West Virginia and provide a basis for projecting agricultural education programs to serve that sector of the labor force. Inherent in this appraisal was a census of the number and kinds of agencies employing agricultural workers, and the number and types of agriculturally oriented positions and occupations.

Method.-- The state in toto constituted the universe for a census of non-farm agricultural occupations. By personal interview data were collected from responsible officers or personnel in agencies likely to be employing persons who would classify as agricultural workers. Agricultural education personnel surveyed all counties in the state and conducted the interviews. To achieve maximum uniformity in the census, workshops were conducted to train interview personnel.

A second segment of the study involved the analysis of the census data, and a pilot program was planned to serve as a guide for the later development of statewide programming.

Findings.-- Interviews with representatives of those firms, businesses, organizations, industries and services considered to be employers of agricultural workers revealed that 1,717 such agencies employed a total of 13,851 non-farm agricultural workers. This employment constituted 3.6 percent of the total labor force in West Virginia. This coupled with a farm employment of 20,775, or 5.4 percent of the labor force, gave a total agricultural employment of 34,605, or 9 percent of the labor force.

A close ratio of the number of commercial farms to the number of non-farm agricultural workers was found to exist both on an area and state basis.

The non-farm agricultural employment was distributed into eight categories: Forestry, 33.2 percent; Livestock and Poultry Industries, 18.1 percent; Farm Supply and Equipment, 12.8 percent; Agricultural Service, 10.3 percent; Ornamental Horticulture, 9.7 percent; Wildlife and Recreation, 6.0 percent; Produce Industry, 6.0 percent; and Farm Service, 4.0 percent. All categories revealed a significant number of employment opportunities with implications of need for vocational education programs to serve the non-farm agricultural sector of the labor force.

CLARY, JOSEPH RAY. Guidelines for the Development of Training Programs for Agricultural Technicians. Dissertation, Ph.D., 1964, The Ohio State University. 309 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The major purpose of the study was to develop guidelines for use in planning and conducting training programs for agricultural technicians. An effort was made (1) to determine the status and characteristics of present training programs for agricultural technicians, (2) to determine the degree of emphasis administrators of present programs believe should be given to certain procedures in developing successful training programs, and (3) to synthesize, refine, and evaluate a tentative set of guidelines for use in planning and conducting training programs for agricultural technicians.

Method.-- This was a national study limited to public institutions at the post-high school level, excepting four-year colleges, with organized curricula designed for the preparation of agricultural technicians.

Instruments were prepared by the investigator to secure data on the status and characteristics of present training programs for agricultural technicians in institutions identified with the help of state directors of vocational education. A structured check list was used to record degrees of emphasis which should be given to certain procedures in the development of successful programs.

A tentative list of guidelines and supporting statements were synthesized from an extensive review of literature on training programs for technicians. These were revised and evaluated by a national jury of leaders in technical education fields.

Findings.-- Institutions with training programs for agricultural technicians could be classified into four general categories: technical institutes, junior colleges, comprehensive community colleges, and area vocational-technical schools.

A total of 59 training programs for agricultural technicians in 25 institutions were identified in this study. A number of new programs were in the planning stages.

Guidelines and supporting statements were synthesized, refined, and evaluated in the following areas: (1) objectives of the program; (2) types of programs offered; (3) curriculum content; (4) recruitment; (5) student services (selection, counseling, placemment and follow-up, and residence facilities); (6) library; (7) instructional staff; (8) facilities and equipment; (9) acceptance by industry, business and educational leaders; (10) evaluation; (11) accreditation and/or licensing; and (12) location.

CUNNINGHAM, REX EDWIN. Administration and Objectives of On-The-Job Guidance and Training Programs for Vocational Agriculture Students in Northwestern Ohio. Thesis, M.S., 1964, The Ohio State University. 147 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- The purpose of this study was to establish objectives, determine responsibilities and make recommendations regarding the organiza- and administration of on-the-job guidance and training programs, in off-farm agricultural industries for students of vocational agriculture.

Method.-- Data for the study was secured through a questionnaire obtained from high school superintendents, guidance counselors, vocational agriculture teachers, and representatives of off-farm agriculture industries located within the rural areas of sixteen counties in Northwestern Ohio.

Findings.-- Objectives for such programs should consider providing practical application of classroom instruction, assist the student in selecting an occupation, expose students to several occupations, have the student work under supervision and develop their ability to work with other people. Eighty-eight percent of off-farm agricultural industries were willing to cooperate. Only juniors and seniors selected by the guidance counselor and vocational agriculture teahcer should be enrolled. Students should work from 41-120 days as a part of the school day, three to four hours per day and be compensated from $ .75 to $1.00 per hour.

DEVITT, JACK LEO. Occupations Related to Agriculture in Putnam County, Ohio. Thesis, M.S., 1964, The Ohio State University. 129 p. Main Library, The Ohio State University, Columbus, Ohio,

Purpose.-- The study was undertaken to determine the total number employed, the yearly openings, salary of those employed and training needed in the various agriculture-related occupations in Putnam County, Ohio. Additional objectives of the study were to determine the employment opportunity for part time farmers and for junior and senior vocational agriculture students. It was believed that this information would be valuable in establishing new vocational programs and in student guidance.

Method.-- The vocational agriculture teachers and the county agent of Putnam County when surveyed indicated an interest in obtaining information about the agriculture-related occupations. They also agreed to help conduct a personal interview of a responsible individual of each agriculture-related business in their communities. An outlined questionnaire was formulated to help guide those interviewing. The agriculture-related businesses to be included in the study were determined by the author and those who helped interview. The author then compiled and interpreted the information and presented the findings.

Findings.-- The study indicated a total of 1,656 positions in agriculture-related occupations or about one-half of the 3,190 employed by all industry in Putnam County. An annual need of 52 full time and 119 part time persons in the agriculture-related occupations was indicated. Of those employed full time, 52 percent were found to be making $5,000 or more. Representatives of almost all the occupational areas studied indicated the need for many of the types of training provided by vocational agriculture. A majority of those interviewed said they would hire part time farmers. The study also revealed employment opportunity for 134 junior and senior vocational agriculture students on a part time basis

GARDNER, HARRISON. Determining Competencies for Initial Employment in the Dairy Farm Equipment Business. Thesis, Ph.D. 1964, Michigan State University, 238 p. Library, Michigan State University, East Lansing, Michigan.

Purpose.-- The purpose of this study was to demonstrate a method of identifying certain competencies and related information essential to the success of persons who seek employment in non-farm occupations that provide the farmer with direct-contact services. This information should provide a basis for the development of effective training programs.

Method.-- The method utilized to gather occupational information and translate the information into vocational programs was developed in the perspective of a larger, more inclusive framework. Data were secured relevant to one phase of the non-farm agricultural industry, the dairy farm equipment business. From a review of occupational literature, a list of 129 worker competencies was prepared in the form of a questionnaire, to obtain information considered important for the preparation of workers who, during initial employment, sell, install, or maintain bulk tanks or milking systems.

The questionnaire was completed by a panel of 11 persons considered to be authorities within or associated with the dairy industry, and a group of 88 Michigan teachers of vocational agriculture. The panel members indicated the value and importance of each competency for entrance workers. The teachers indicated which of the competencies had been taught in all-day, young farmer or adult farmer classes, during the past year. The responses for the panel members and teachers were tabulated and compiled into tables. These tables summarize the percentage of responses by both the panel members and teachers to each of the items in the questionnaire.

Findings.-- Responses of panel members indicated that the method demonstrated in this study was effective in obtaining important information for workers who seek employment in certain non-farm agricultural occupations. These occupations provide the farmer with direct-contact services through the sale, installation, and maintenance of bulk tanks or milking systems. The method as demonstrated was effective in providing information that can be used as a basis for developing training programs.

The responses of the panel members provided consistent clusters of competencies around which educational programs can be organized. Clusters of competencies were identified in the areas of farming, human relations, salesmanship, and mechanics that are important for employees who during initial employment sell, install or maintain bulk milk tanks or milking systems.

Nearly three-fourths of the 129 competencies were rated by over 60 percent of the panel members as having considerable value for these workers. Over 60 percent of the panel members indicated that: (1) slightly over one-half of the competencies were important for workers who during initial employment only sell or sell and maintain the prescribed dairy equipment; (2) slightly less than one-fourth of the competencies were important for workers who install, maintain, or install and maintain equipment. The clusters of competencies should provide a basis for the development of operationally-defined objectives.

Responses of teachers indicated that few of the competencies identified by the panel members as those needed by workers who sell, install, or maintain bulk milk tanks or milking systems were being taught as a part of local programs of vocational agriculture in Michigan.

GRIFFIN, WARREN L. The Nature of Agricultural Occupations, Other Than Farming, in Saline County, Missouri. 364 p., Library, University of Missouri, Columbia.

Purpose.-- The purpose of this study was to determine the present and emerging agricultural occupations, other than farming, found in Saline County, Missouri; and the competencies and prerequisites needed by an individual to enter and advance in the occupations.

Method.-- Data relating to the follow-up of 450 former students of vocational agriculture were obtained primarily from school records and personnel. Data concerning agricultural occupations, other than farming were obtained from interviews with 112 owners, managers or other office personnel of businesses dealing with agricultural products and/or services.

Findings.-- At the time of the study there were 112 agencies and firms in operation employing 2,006 persons, of whom 615 or 30.6 percent needed a knowledge of agriculture in order to perform their jobs. There were 28 firms which dealt in plant products or services, 18 in farm equipment and repair shops, 17 in food processing, 16 in animal products and services, 12 in feed, seed and fertilizer, 11 lumber companies, 9 educational and governmental agencies, and 5 firms which offered farm managerial services.

Of the 615 workers who were employed in agricultural jobs, there were 274 or 44.5 percent in semi-skilled jobs, 92 or 14.9 percent in skilled jobs, 4 or 0.6 percent in clerical jobs, 76 or 12.3 percent in sales, 38 or 6.1 percent serving as supervisors or foremen, 85 or 13.8 percent serving as proprietors or manager, 17 or 2.7 percent serving as technicians, and 29 or 4.7 percent in professional agricultural jobs.

Eighty different occupations were found in which an agricultural background and/or training was required. The activities and duties of employees varies greatly in the different occupations. In most cases, the fewer the number of employees in a firm, the more varied the activities and duties; likewise, the larger the firm and the greater the number of employees, the more specific the activities and duties. The technical knowledge required of employees to enter and advance in agricultural occupations, other than farming, varies greatly with particular occupation and the phase of agriculture involved.

HALTERMAN, JERRY JACK. Determination of the Educational Needs of Agricultural Engineering Technicians in Ohio. Dissertation, Ph.D., 1964, The Ohio State University. 300 p. Library, The Ohio State University, Columbus, Ohio.

Purpose.-- This study was concerned with the educational needs of agricultural engineering technicians in Ohio and in the development of curriculums for the satisfactory preparation of such technical workers. In brief, an effort was made to: (1) determine the important characteristics and attributes of the agricultural engineering manpower force of the State, (2) determine the kinds of activities technicians engage in on the job and the technical competencies essential for satisfactory job performance, (3) develop suggested curriculums for use in the preparation of agricultural engineering technicians, and (4) comprehensively review the literature pertinent to technical workers and technical education.

Method.-- In this survey type study, two questionnaires were used on a State-wide basis to obtain data from technical workers, employers, and jury members. The educational needs of technicians were determined from an analysis of responses which indicated the extent technicians engage in various activities and the importance selected general, technical, and agricultural education subject matter areas are to the satisfactory qualification of technicians.

Findings.-- Technical occupations ranging from these that are of narrow scope and limited level to those of broad scope and high level are found in the field of agricultural engineering. Approximately 40 percent of the tractor and farm machinery dealers have technicians in their employ and over one-half (54.5%) of the technical workers in this field spend a predominate part of their time in the area of agricultural power and machinery.

Technical workers in the major areas of agricultural engineering and mechanics regularly engage in groups of activities which have to do with giving leadership and direction, making verbal or written accounts, and offering advice and expertness to others. General education subject matter areas important to these technicians include communication skills (English composition, speech, and reading); elementary mechanics; technical drawing; personnel management; electricity, magnetism and electronics (basic theory); and psychology. Special education subject matter areas considered important are basic agricultural mechanics, safety, materials-handling, and occupational experience. The availability of additional qualified workers and the adequate education of present employees constitutes the major problems of employers.

Technical education characteristically is post-high school, terminal, occupation centered, less than baccalaureate degree level, specific preparation for employment, oriented toward math and science, and two years in length. Emphasis is upon technical and cognitive skill in contrast to manipulative skill and upon skill and ability to make practical applications of theoretical knowledge in performing specific tasks in a specialized field. Analysis is made of occupations to determine needs and job analysis is the basis of curriculum development. Preparation is made for occupational proficiency in families or clusters of jobs. A proper balance of general education, technical education, and related education subjects is maintained.

HAMILTON, WILLIAM HENRY. Competencies in Agriculture Needed by Males Employed in Retail Feed Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 126 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To determine the agricultural competencies needed by males employed in retail feed distribution, the degree of competency needed and possessed by employees in each competency, and to identify employment opportunities in the industry in Iowa.

Method.-- A panel of 15 selected managers of outstanding feed dealerships in Iowa identified the important agricultural and nonagricultural competencies needed by males in retail feed distribution. A questionnaire was developed around this list and submitted to managers and employees of outstanding feed dealerships in Iowa with instructions to indicate the degree of competence needed and possessed in the competencies listed. Responses (140) were analyzed using mean scores. An additional questionnaire was developed and submitted to a stratified random sample (445) of Iowa feed dealerships, asking each manager to indicate the number of persons employed in 1958, 1963, and to be employed in 1968 and the ages of each employee presently employed.

Findings.-- Of the 41 agricultural competencies identified, 22 were understandings and 19 were abilities. Twenty-five competencies pertained to farm abilities and understandings and 16 to dealership operations. Highest overall scores for competencies needed for all groups were found for the abilities to *analyze a farmers cre*dit potential and when to extend credit, to communicate with farmers, to accurately compute formulations for custom mixes with various size lots of grain delivered for processing, to recognize potentially good customers, and the understanding of animal nutrition, health and sanitation. In 83.9 percent of all competency ratings, competence needed was higher than competence possessed.

Managers averaged higher competency needed than possessed scores on their ratings of themselves and of their employees in 90.7 percent of comparisons made.

Chi-square analysis was used to test the comparison of the degree the 10 most important competencies were needed and possessed within three areas: vocational agriculture training, educational level and farm background.

The comparison of the employer's evaluations of employees who had and had not had vocational agriculture produced highly significant differences for both degree competency was needed and possessed, possessed scores being lower for the employees who had had vocational agriculture..

Comparisons of degree needed and possessed scores for managers grouped by educational achievement were highly significant for both degree needed and possessed, both scores increasing as the educational level of achievement increased.

Comparisons of degree possessed scores for managers grouped according to years of farm background were highly significant, with the scores increasing as years of farm background increased.

Comparisons of the employees' self-evaluation of degree possessed scores, when grouped by farm background, were highly significant; the scores increased as years of farm background increased.

An estimated 12,530 males were employed full-time in the feed, grain and fertilizer dealerships in Iowa in 1963. The anticipated employment in 1967 was projected to be approximately 15,700 men. New employees plus anticipated replacements for retiring workers resulted in an estimated 1,060 job openings in the industry each year in Iowa.

KAHLER, ALAN ARNOLD. Competencies in Agriculture Needed by Males Employed in Retail Farm Machinery Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 201 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To determine the important agricultural competencies needed by males employed in retail farm machinery distribution, the degree of competency needed and possessed by employees in each competency, and the employment opportunities in that industry in Iowa.

Method.-- A panel of the fifteen most progressive farm machinery dealers in Iowa listed the important agricultural competencies needed by employees in the various occupational areas in the retail farm machinery industry. A questionnaire was developed around this list and submitted to 100 outstanding dealers and their employees (179) in Iowa with instructions to indicate (1) the degree the competencies were needed in order to effectively perform the functions of their jobs and (2) the degree the competencies were possessed by the employee. An additional questionnaire was developed and sent to all farm machinery dealers in the state (1120) asking each dealer to indicate the number of persons employed in 1958, 1963, and to be employed in 1968 and the ages of each employee presently employed. Responses indicating degree of competency needed and possessed were analyzed using mean scores.

Findings.-- Of the 56 competencies listed by the panel, 31 were understandings and 25 were abilities. Thirty-one competencies pertained to dealership management and service, 14 were in the area of farm management, and 11 in the areas of livestock and crop production. Highest overall scores were found for the understanding of the types of machinery used in the local farming area, machinery financing procedures, economic reasons for use of labor saving machines, capabilities of present and prospective farm machines, farm credit procedures and the ability to manage trade-in inventory, estimate trade-in values of used machinery, make machinery valuations, adapt machinery size to farm operation and locate failures and make repairs quickly and efficiently. Competencies in farm management had the highest consistent scores when compared with the scores of competencies in other areas.

Employer and employee scores for all competencies were higher for the degree of competency needed than for the degree of competency possessed. Employee scores were higher than employer scores for both degree competencies were needed and possessed.

As years of farm experience of managers, clerical, parts and service employees increased, the scores for degree of competency needed and possessed increased. Conversely, the degree of competency needed and possessed decreased for sales employees as years of farm experience increased.

The degree competencies were needed and possessed for all employees increased as years of vocational agriculture training increased.

Both the degree of competency needed and possessed for each competency decreased as the size of business increased. The highest scores were found for employees in businesses with gross volumes of sales under $300,000.

An estimated 6260 persons were employed in 1082 dealerships in 1963, whereas 5802 persons would probably be employed in 834 dealerships in 1968. By 1968, an estimated 598 new employees will be needed to fill the new job openings in the 834 probable dealerships, and 361 employees will likely be needed to replace retiring workers. Of these 959 new employees and replacements, 423 will be needed as service employees, 139 as managers, 170 as salesmen, 70 as clerical workers, 95 as parts men, and 53 as departmental managers.

MABON, ELWOOD JACKSON. *Competencies in Agriculture Needed by Males Employed in Country Elevator Grain Marketing.* Thesis, M.S., 1964. Iowa State University of Science and Technology, 160 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To determine: (1) the important agricultural competencies needed by males employed in country elevator grain marketing; (2) the degree each agricultural competency was needed and possessed; (3) factors that influenced the degree personnel needed and possessed each agricultural competency; (4) the important nonagricultural competencies and the degree each was needed; (5) the employment opportunities in the industry in Iowa.

Method.-- This was a state-wide three-phase study. Sixteen country elevator managers in well managed businesses were selected as a panel of specialists by the Iowa grain trade associations to aid in identifying the important agricultural and nonagricultural competencies needed by grain personnel. Phase 1: Questionnaires were mailed to 310 persons in 155 well managed elevators. Personnel in 143 elevators (92%) returned questionnaires. A total of 264 questionnaires were used from 132 elevators having both a manager and an employee who mailed questionnaires. Product moment correlation matrices were developed including 52 variables. Phase 2: The degree managers and employees needed nonagricultural competencies were evaluated by the panel. Phase 3: One-fourth (272 by random sample) of the most up-to-date list of 1088 country elevators was mailed employment data questionnaires (88.6% questionnaire response).

Findings.-- Thirty-seven agricultural competencies, identified by the panel, were confirmed by the 264 managers and employees to be important competencies needed by grain business personnel. Highest overall mean scores for all employees were found for the abilities to identify various types of grain, to sample, weigh and grade grain, figure and receive grain bids, analyze a farmer's credit potential and to know whether to extend credit, and the understandings of moisture migration and its effects on grain, and grain marketing procedures.

In general, the higher the level of job classification the greater the degree of importance of the competencies, according to the managers' evaluations for all three job categories and the self-evaluations by the employees. Respondents consistently indicated a need for greater competency than they possessed.

Farm experience was part of the background of 73 percent of the personnel. Comparisons indicated that the group with no farm experience needed more, but possessed less competence, than those groups with farm experience.

PHIPPS, LLOYD J., AND OTHERS. Technical Education in and for Rural Areas, Technicians and Other Workers Who Need Technical Knowledge. 74 p. Division of Agricultural Education, College of Education, University of Illinois, Urbana, Illinois. Nonthesis study.

Purpose.-- To determine the need for technical education for persons living in and serving rural areas and to develop curriculums for clusters of occupations found in and serving rural areas.

Method.-- A two-stage, cluster sample of businesses drawn at random was interviewed. Data relating to need were projected to the population universe. A principal axis factor analysis with a varimax rotation was utilized to obtain clusters of activities and of knowledges. Factor scores for each job title identified was obtained for each factor identified.

Findings.-- Following is a summary of the findings:

1. Retailing and service functions were predominant among the businesses studied.

2. Many businesses in rural areas were multi-purpose and had several functions.

3. Technicians requiring a wide variety of technical abilities were employed in rural areas.

4. Technicians needing technical competence in the biological and soil sciences and in agricultural engineering were predominant among the technicians identified.

5. The need for technicians is increasing.

6. There is considerable need for additional technicians in rural areas.

7. Technicians and other workers needing some technical education who are employed in rural areas may be clustered into groups in terms of their activities and knowledge areas. Thus, curriculums may be designed to meet the needs of clusters of workers needing technical education.

VAN LOH, FREDERICK ALVIN. Competencies in Agriculture Needed by Males Employed in Retail Fertilizer Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 110 p. Library, Iowa State University of Science and Technology, Ames, Iowa.

Purpose.-- To determine (1) the important agricultural competencies needed by males employed in retail fertilizer distribution, and (2) the degree of competency needed and possessed by employees in each competency.

Method.-- A panel of 12 specialists from independent, cooperative, and incorporated retail fertilizer firms in Iowa and of the Iowa State University of Science and Technology identified the important agricultural competencies needed by employees in the various occupational areas in the retail fertilizer industry. A questionnaire was developed around this list and submitted to the 120 Iowa firms offering application and/or spreading services to farmers in 1964 with instructions to indicate (1) the degree the competencies were needed in order to effectively perform the functions of their jobs, and (2) the degree the competencies were possessed by the employee. Usable data were obtained from 94 managers, 44 sales personnel and 43 service employees. Responses indicating degree of competency needed and possessed were analyzed using mean scores.

Findings.-- Of the 29 agricultural competencies listed by the panel, 14 were understandings and 15 were abilities. Thirteen of the competencies pertained to various phases of farming and 16 to dealership management and service. Highest overall scores were found for the understandings; amounts of fertilizer required for various levels of crop production; seed quality and plant population relative to fertilizer response; weed and insect problems and their control; and the abilities to interpret a soil test report; identify fertilizer materials and evaluating formulas; make proper recommendations regarding fertilizer use and help individual customer keep a fertilization history on his farm; recognize good, new fertilizer practices and recommend their use; recognize plant food deficiency in growing crops; make recommendations in absence of a soil test report; and determine an individual's financial situation and management level.

Employer and employee scores for all competencies were higher for the degree of competence needed, than for the degree of competence possessed. Employee scores were higher than employer scores for both the degree competencies were needed and possessed.

Relationships between selected control variables and the 10 most needed competencies as rated by all employees were studied using analysis of correlation. From the correlation matrix including only managers, farm background was negatively correlated with degree competence was needed for all but one of the competency variables while being positively correlated with degree competence was possessed.

A correlation matrix using the same variables but including all employees was developed. Vocational agriculture training was more highly correlated with competencies needed and possessed than the other control variables used. Highest correlation coefficients were found to exist between vocational agriculture training and competence needed for the ability to make recommendations in absence of a soil test report (.325), competency possessed for the ability to recognize good, new fertilizer practices and recommend their use (.311) and competence possessed for understanding seed quality and plant population relative to fertilizer response. (.290).